



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OFFICE OF CHEMICAL SAFETY AND
POLLUTION PREVENTION

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MEMORANDUM

SUBJECT: Ecological Risk Assessment for Proposed Section 3 New Uses for Fluopyram on Artichoke, Vegetables (Brassica, bulb, cucurbits, fruiting, leafy, legumes and root/tuberous/corm), Carrot, Cereal grains, Citrus, Cotton, Ginseng, Grapes, Small vines fruits, grasses (forage/feed/seed), Herbs, Hops, Soybean, Oil seed group, Ornamentals, Peanut, Pome fruits, Potato, Small berries, Stone fruit, Strawberry and other low-growing berries, Sugarbeet, Tree nuts and Turf

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This memo contains the findings of a Section 3 New Use Ecological Risk Assessment for eleven new or amended labels that cover seed treatment for cotton, soybean and peanuts, and soil/foliar applications by ground/air/air blast/chemigation for many crops and foliar/drench applications by ground/chemigation for turf and ornamentals. The eleven new or *amended* labels are for products with formulations containing fluopyram alone and formulations containing fluopyram with other active ingredients. Fluopyram is a fungicide and current formulations for fluopyram include suspension concentrates for the chemical alone (41.5% a.i), or with other fungicides including tebuconazole, trifloxystrobin, pyrimethanil, or prothioconazole. Fluopyram and /or its mixtures have agricultural uses on apples, watermelons, selected dry beans, grapes (wine), peanuts, potatoes, strawberries, sugar beet, and tree nuts applied by ground, air blast, and aerial spray into foliage and seed treatments for cotton, soybean and peanuts. Fluopyram is a fungicide to prevent

and/or control fungal diseases. The biochemical mode of action of this chemical involves the inhibition of the enzyme succinate dehydrogenase within the fungal mitochondrial respiratory chain, thus blocking electron transport. Risk associated with the proposed new uses of fluopyram are confined primarily to terrestrial taxa. For spray applications there was chronic dietary based risk from consumption of all dietary categories but the fruit/pods/seeds category. Spray applications also resulted in chronic dose-based risk to mammalian taxa in every size class for short grass for most dietary items for small and medium sized mammals. Exposure to Fluopyram via seed treatments potentially poses acute risk to small and medium sized endangered avian and mammalian species. There was chronic risk indicated for both avian and mammalian taxa from all seed treatments.

I. Previous Use Patterns and Ecological Risk Assessments

Two ecological risk assessments were conducted previously. The first assessment was for a Section 3 new chemical registration of fluopyram (DP Barcode D353315, 369756, and 385637, dated 8/29/11). This assessment covered the following crops: Apples, Beans (dry), Cherries, Cucurbits, Grapes (wine), Peanut, Potato, Stone Fruits, Strawberry, Sugar beet, and Tree Nuts. The second assessment (DP Barcode 414232 dated June 25, 2014) was for Fluopyram New Uses on cotton “in-furrow and seed treatment”, Soybeans “seed treatment” and Peanuts “in-furrow and foliar applications.

The results of the first assessment (DP Barcode D353315, 369756, and 385637) suggested the potential for chronic risk to non-target mammals, birds, reptiles and terrestrial-phase amphibians based on modeled exposure resulting from spray applications of fluopyram. RQs for acute exposure were not calculated in the previous risk assessment due to non-definitive endpoints that were higher than the highest concentrations tested. Because of this, the author of previous assessment presumed low acute risk concerns (at levels below the levels of concern) exist for mammals, birds, reptiles and terrestrial-phase amphibians. An addendum was submitted to the Environmental Fate and Ecological Risk Assessment for Fluopyram Registration to correct the endpoints and risk quotients reported for the mammalian toxicity studies (DP Barcode: 396805). The corrected calculations still indicated chronic risk concerns using dose-based RQs, although a noticeable shift in magnitude occurs. All dietary-based RQs are below the level-of-concern.

The second assessment for in-furrow and seed treatment applications (DP Barcode 414232) showed low risk to aquatic organisms and terrestrial plants. Acute risk was indicated from both seed treatments. Soybean seed treatments may potentially adversely affect listed small avian taxa (20g weight class) on acute basis and cotton seed treatments may potentially adversely affect both small and medium listed avian and mammalian taxa (20 g and 100 g for birds and 15 and 35g for mammals) on an acute basis. There was chronic risk indicated for both avian and mammalian taxa from all four of the proposed new uses.

This assessment considers use patterns for eleven new labels (**Appendix I, Tables I-1 to I-11**) which covers new and already registered crops (i.e., amendments to labels). In addition, this assessment uses the surface water concentration calculator (SWCC) for modeling exposure EECs for surface/pore waters and sediment resulting from all uses (current/amended plus new).

II. Current/Amended and New Use Patterns

In previous ecological risk assessments, the following labels were considered:

- 1) Labels considered in the 1st assessment were for five labels: **LUNA® PRIVILEG**, **PROPULSE™**, **LUNA® TRANQUILITY**, **LUNA® EXPERIENCE**, and **LUNA® SENSATION**. These labels covered many crops at the time of registration of the new chemical fluopyram; and
- 2) Labels considered in the 2nd assessment were for **FluopyramST (EPA Reg. No. 264-xxx)** and the amended label of **Luna® Privilege (EPA Reg. No. 264-1078)**. **FluopyramST** label (a.i: fluopyram alone) covered use of fluopyram as a seed treatment for cotton (0.066 lb. a.i/A) and soybeans (0.138 lb. a.i/A). In contrast, the *amended Luna® Privilege* (a.i: fluopyram alone) covered in-furrow ground application for cotton at planting (0.222 lb. a.i/A) and in-furrow plus ground/air foliar applications for peanuts (two applications at 0.22 lb. a.i. with 14-day interval).

In this assessment, the proposed eleven *new* or *amended* labels cover seed treatment for peanuts and soil/foliar applications by ground/air/air blast/chemigation for many crops and foliar/drench applications by ground/chemigation for turf and ornamentals. The eleven new or *amended* labels are for products with formulations containing fluopyram alone and formulations containing fluopyram with other active ingredients. **Table 1** contains a list of these products.

Table 1. List of the proposed products containing the active ingredient alone or with others

Item	Product Name ¹	Reg. No.	Active Ingredient(s)	Use Purpose
1	FLUOPYRAM 500 SC	432-xxxx	Fluopyram alone	Fungicide/Nematicide In Turf & Ornamentals
2*	LUNA® PRIVILEGE	264-1078	Fluopyram alone	Fungicide In Crops (refer to Appendix I, Tables I-1 to I-11)
3*	PROPULSE™	264-1084	Fluopyram & Prothioconazole	
4*	LUNA® TRANQUILITY	264-1085	Fluopyram & Pyrimethanil	
5*	LUNA® EXPERIENCE	264-1091	Fluopyram & Tebuconazole	
6*	LUNA® SENSATION	264-1090	Fluopyram & Trifloxystrobin	
7-9	FLU+TFS SC 25/32.5/500	432-xxxx		Fungicide/Nematicide In Turf & Ornamentals
10	13ESP715 3.3 SC	432-xxxx	Fluopyram alone	Nematicide In Turf & Ornamentals
11	13ESP715 3.3 SC	432-xxxx	Fluopyram alone	

¹ for items 2*, 3*, 4*, 5*, and 6*: labels for these products are *amended* by mainly by adding more crops while **items 1, 7, 8, 9, 10 and 11** are proposed new labels

A summary of important label information is included in **Appendix I, Tables I-1 to I-11**.

III. Estimating Exposure EECs from Surface Water Sources

The Surface Water Concentration Calculator (SWCC) was used to calculate surface water EECs base on application/chemical parameters and crop representative scenarios (**Tables 2 and 3**). Tier II SWCC estimates pesticide concentrations in water bodies that result from pesticide applications to land. This model is designed to simulate the environmental concentration of a pesticide in the water column and sediment. The model uses PRZM version 5.0+ (PRZM5) and the Variable Volume Water Body Model (VWWM), replacing the older PE-5 shell, which used linked PRZM3 (Carousel et al., 2005) and EXAMS (Burns, 2003). For more information about the SWCC model refer to the EPA web¹.

Application parameters/scenarios

The following steps were taken for modeling surface water EECs using the SWCC model:

- (1) Extraction of modeling parameters: This was based (1) current labels with associated use patterns and (2) suggested new or amended labels with use patterns summarized in (**Appendix I, Tables I-1 to I-11**). Extracted modeling parameters were for soil/foliar applications and seed treatment include: maximum single rates (**MSRs** in Kg/ha), maximum number of applications (**MNAs**), maximum yearly application (**MYAs** Kg/ha/year), and first application dates (**FADs**) in addition to the application procedure (**G**= ground; **A**= aerial; **AB**= air blast). It is noted that: (a) chemigation and drench were considered as ground applications to the soil and (b) seed treatments were considered as application to depths equal seeding depths of the crops;
- (2) Assignment of crop scenarios to represent various use patterns; and
- (3) Made sure to include various types of formulations containing fluopyram alone and mixtures in determining the highest application rates of the active ingredient fluopyram; the subject of this memo.

Table 2 contains a summary of the extracted application parameters and scenarios for SWCC modeling which represent current and amended proposed labels for seed treatments of cotton, soybeans and peanuts.

Table 2. Summary of modeled application parameters for fluopyram use as seed treatment

Crop	Application Type ¹	Scenario ²	Application Rate (Kg/ha)		MAI/F AD (Days) ⁴	AP- PR	Depth (cm) ⁴
			Single ³	Total/Year			
Cotton ⁵	Seed Treatment	STXcottonNMC	0.074	0.500	At planting	G	1.27
	1 st Foliar Application		0.250		153	A/G	Surface
	2 nd Foliar Application		0.176		160		Surface

¹ URL: <http://www.epa.gov/oppefed1/models/water/>

Soybeans ⁵	Seed Treatment	MSsoybeanSTD	0.155	0.500	At planting	G	1.91
	1 st Foliar Application		0.250		158	A/G	Surface
	2 nd Foliar Application		0.095		165		Surface
Peanuts ⁵	Seed Treatment	NCpeanutSTD	0.318	0.500	At planting	G	3.81
	1 st Foliar Application		None		None	A/G	Surface
	2 nd Foliar Application		0.182		140		Surface

¹ Assume planting with treated seeds followed by applying one or two foliar applications to the maximum yearly application of 0.5 kg a.i./ha;

² Crop scenario that gives the highest EDWC for the crop in question;

³ Assume seed treatment (for cotton= 0.074 Kg a.i./ha; for soybeans= 0.155 Kg a.i./ha; and for peanuts= 0.318 Kg a.i./ha) followed by the 1st application= the maximum single foliar application for the crop and the 2nd foliar application= 0.500 minus (seed treatment + 1st application);

⁴ Depth (cm) = Minimum reported seeding depth; noting that this depth is variable depending on the geographic location and climatic conditions where the crop is planted;

⁵ The application rates for seed treatments were calculated as follows: **(1) For cotton:** Rate= BEAD maximum seeding rate of 85,000 seeds/A: Application Rate= 0.07716 X (85,000/100,000)= 0.066 lb. a.i. /A (0.074 Kg/ha); **(2) For soybean:** Rate= BEAD maximum seeding rate of 250,000 seeds/A: Application Rate= 0.07716 X (250,000/140,000)= 0.137786 lb a.i. /A; and **(3) For peanuts:** Rate= 0.124475 lbs a.i./100 lbs of seeds= 0.00124475 lb a.i./lb of seed; given that Lbs seed/A= 105,000 seeds/460= 228.261 lbs of seeds, the rate is equal to 0.00124475 lb a.i./lb of seed x 228.261 lbs seeds/A= 0.284 lbs a.i./A (refer to amended **LUNA® PRIVILEGE** label). All seeding rates are based on the maximum seeding rate published by BEAD.

In modeling for applications that include seed treatments in cotton, soybean and peanuts, the application of seeds were @ depth (equal to seeding depth), followed by one or two foliar application(s) by air. Additionally, **Table 3** contains a summary of the extracted application parameters and scenarios for SWCC modeling which represent current/amended/newly proposed labels for various crops and turf and ornamentals.

Table 3 Summary of modeled application parameters for fluopyram use on crops

<i>Crop Group</i>	<i>Crop(s)</i>	<i>Scenario</i>	<i>MS R</i>	<i>MN A</i>	<i>MY R</i>	<i>MAI</i>	<i>AP-PR</i>	<i>FADs</i>
Artichoke	Artichoke	CARowCropRLF_V2	0.25	2	0.50	7	Air And Ground	Due to the fact that this chemical may be applied throughout the growing season, SWCC batch runs were used by applying the pesticide over a 240 day time window at 5-day steps starting the 1 st application at 14 days after
Beans & Peas	Beans	ILbeansNMC	0.20	2	0.40	7		
		MIbeansSTD	0.20	2	0.40	7		
		WAbeansNMC	0.20	2	0.40	7		
	Snap bean	ORsnbeansSTD	0.19	2	0.38	10		
Brassica Vegetables	Cabbage	FLcabbageSTD	0.25	2	0.50	5		
	Cole crops	CAColeCropRLF_V2	0.25	2	0.50	5		
Bulb Vegetables	Onion	CAonion_WirrigSTD	0.25	2	0.50	5		
		GAonion_WirrigSTD	0.25	2	0.50	5		
		WAonionsNMC	0.25	2	0.50	5		
	Garlic	CAGarlicRLF_V2	0.25	2	0.50	5		

Canola	Canola	NDcanolaSTD	0.25	2	0.50	12	<p>emergence and the 2nd application at 14+the application interval. For example, artichoke: CARowCropRLF_V2 was run for 240 days at 5-day steps with the 1st application at 14 days after emergence and the 2nd application at 14+7= 21 days.</p> <p>Maximum EDWCs represent results obtained for the growing season not the 240-day time window</p>	
Carrot	Carrot	FLcarrotSTD	0.25	2	0.50	5		
Cereal Grains Crops And Forage, Fodder or Straw	Corn	CACornOP	0.25	2	0.50	14		
		IACornstd	0.25	2	0.50	14		
		ILCornSTD	0.25	2	0.50	14		
		INCornStd	0.25	2	0.50	14		
		KSCornStd	0.25	2	0.50	14		
		MNCornStd	0.25	2	0.50	14		
		MScornSTD	0.25	2	0.50	14		
		NCcornESTD	0.25	2	0.50	14		
		NCcornWOP	0.25	2	0.50	14		
		NDcornOP	0.25	2	0.50	14		
		NECornStd	0.25	2	0.50	14		
		OHCornSTD	0.25	2	0.50	14		
		PAcornSTD	0.25	2	0.50	14		
		STXcornNMC	0.25	2	0.50	14		
		TXcornOP	0.25	2	0.50	14		
	Sorghum	KSsorghumSTD	0.25	2	0.50	14		
		TXsorghumOP	0.25	2	0.50	14		
	Sweet Corn	FLsweetcornOP	0.25	2	0.50	14		
		ORswcornOP	0.25	2	0.50	14		
	Wheat & Barley	CAWheatRLF	0.25	2	0.50	14		
		NDwheatSTD	0.25	2	0.50	14		
		ORwheatOP	0.25	2	0.50	14		
		TXwheatOP	0.25	2	0.50	14		
Christmas Trees	Christmas trees	ORXmasTreeSTD	0.25	2	0.50	7	AirBlast	

MSR= Maximum single rate (Kg/ha), **MNA**= Maximum number of applications, **MYA**= Maximum yearly application (Kg/ha/year), **AP-PR**= Application procedure, and the **FAD(s)**= First application date(s)

Table 2 (continued)

<i>Crop Group</i>	<i>Crop(s)</i>	<i>Scenario</i>	<i>MS R</i>	<i>MN A</i>	<i>MY R</i>	<i>MAI</i>	<i>AP-PR</i>	<i>FADs</i>
Citrus	Citrus	CAcitrus_WirrigSTD	0.25	2	0.50	7	AirBlast	Same As Above
		FLcitrusSTD	0.25	2	0.50	7		
		STXgrapefruitNMC	0.25	2	0.50	7		
Cotton	cotton	CAcotton_WirrigSTD	0.25	2	0.50	7	Air	
		STXcottonNMC	0.25	2	0.50	7		

		TXcottonOP	0.25	2	0.50	7	And				
		MScottonSTD	0.25	2	0.50	7					
		NCcottonSTD	0.25	2	0.50	7					
Cucurbits	Melons	CAMelonsRLF	0.25	2	0.50	5	Ground				
		STXmelonNMC	0.25	2	0.50	5					
		MImelonStd	0.25	2	0.50	5					
		MOmelonStd	0.25	2	0.50	5					
		NJmelonStd	0.25	2	0.50	5					
	Cucumber	FLcucumberSTD	0.25	2	0.50	5					
Fruiting Vegetables	Peppers	FLpeppersSTD	0.25	2	0.50	5	Ground				
		CAtomato_WirrigSTD	0.25	2	0.50	5					
		FLtomatoSTD_V2	0.25	2	0.50	5					
		Tomato	PAtomatoSTD	0.25	2	0.50			5		
	All	PAvegetableNMC	0.25	2	0.50	5					
	All	STXvegetableNMC	0.25	2	0.50	5					
Ginseng	Ginseng	MNsugarbeetSTD	0.25	2	0.50	5	AirBlast				
Grapes & Small Vine Fruits	Grapes	CAWineGrapesRLF_V2	0.25	2	0.50	12					
		CAGrapes_WirrigSTD	0.25	2	0.50	12					
		NYGrapesSTD	0.25	2	0.50	12					
Grasses: Forage/Seeds	Hay	CArangelandhayRLF_V2	0.25	2	0.50	14	Air				
	Seeds	ORgrasseedSTD	0.25	2	0.50	14					
Herbs & Spices	Mustard	CAColeCropRLF_V2	0.25	2	0.50	7			And		
	Dill weed	ORMintSTD	0.25	2	0.50	7					
	Parsley/Celery	CARowCropRLF_V2	0.25	2	0.50	7					
Hops	Hops	ORhopsSTD	0.25	2	0.50	7				Ground	
Leafy/ Petiole Vegetables	Lettuce/Spinach	CAlettuceSTD	0.25	2	0.50	7					
	Celery	CARowCropRLF_V2	0.25	2	0.50	7					
	Fennel	CAonion_WirrigSTD	0.25	2	0.50	7					
Legume Vegetables	Soybean	MSsoybeanSTD	0.25	2	0.50	7					Ground
	Snap bean	ORsnbeansSTD	0.25	2	0.50	7					
Ornamentals	Residential	CAresidential/imperviousRLF*	0.25	2	0.50	7	Ground	March 15			

MSR= Maximum single rate (Kg/ha), **MNA**= Maximum number of applications,

MYA= Maximum yearly application (Kg/ha/year), **AP-PR**= Application procedure, and the **FAD**(s)= 1st application date(s)

* For this run, used LA weather (W13970.dvf) with application to impervious surfaces (5% of the applied); drift= 0%

Table 2 (continued)

<i>Crop Group</i>	<i>Crop(s)</i>	<i>Scenario</i>	<i>MS R</i>	<i>MN A</i>	<i>MY R</i>	<i>MAI</i>	<i>AP-PR</i>	<i>FADs</i>
Ornamentals	Nurseries	CAnurserySTD_V2	0.25	2	0.50	5	Ground (G)	Same As Above
		FLnurserySTD_V2	0.25	2	0.50	5		
		MInurserySTD_V2	0.25	2	0.50	5		
		NJnurserySTD_V2	0.25	2	0.50	5		
		ORnurserySTD_V2	0.25	2	0.50	5		
		TNnurserySTD_V2	0.25	2	0.50	5		
Peanut	Peanuts	NCpeanutSTD	0.25	2	0.50	14	A & G	
Pome Fruits	Apples	NCappleSTD	0.25	2	0.50	7	AirBlast	
	Apples	ORappleSTD	0.25	2	0.50	7		
	Apples	PAappleSTD_V2	0.25	2	0.50	7		
	Pear and Quince	WAorchardsNMC	0.25	2	0.50	7		
		CAfruit_WirrigSTD	0.25	2	0.50	7		
Potato and Tuberous & Corm Vegetables	Potatoes	CAPotatoRLF_V2	0.25	2	0.50	5	Air (A) & Ground	
		FLpotatoNMC	0.25	2	0.50	5		
		IDNpotato_WirrigSTD	0.25	2	0.50	5		
		MEpotatoSTD	0.25	2	0.50	5		
		WApotatoNMC	0.25	2	0.50	5		
	Sweet Potato	NCSweetPotatoSTD	0.25	2	0.50	5		
Small Berries	Black/ Rasp Berries	ORberriesOP	0.25	2	0.50	7	AirBlast	
		CAWineGrapesRLF_V2	0.25	2	0.50	7		
Stone Fruits	All	CAfruit_WirrigSTD	0.25	2	0.50	5		
		WAorchardsNMC	0.25	2	0.50	5		
	Peaches	GAPeachesSTD	0.25	2	0.50	5		
	Cherries	MICherriesSTD	0.25	2	0.50	5		
Strawberry	Strawberries	CAStrawberrynonplasticRLF_V2	0.25	2	0.50	7	Air & Ground	
		FLstrawberry_WirrigSTD	0.25	2	0.50	7		
Sugar beet	Sugar beet	CAsugarbeet_WirrigOP	0.25	2	0.50	5		
		MNsugarbeetSTD	0.25	2	0.50	5		
Sunflower	Sunflower	CAcornOP	0.25	2	0.50	14	Ground	
Tree Nuts	almonds	CAalmond_WirrigSTD	0.25	2	0.50	7	AirBlast	
	Pecans	GAPecansSTD	0.25	2	0.50	7		
	Tree nuts	ORfilbertsSTD	0.25	2	0.50	7		
Turf	turf	CATurfRLF	0.25	2	0.50	7	Ground	
		FLturfSTD	0.25	2	0.50	7		

		PA turfSTD	0.25	2	0.50	7		
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MSR= Maximum single rate (Kg/ha), **MNA**= Maximum number of applications, **MYA**= Maximum yearly application (Kg/ha/year), **AP-PR**= Application procedure, and the **FAD(s)**= First application date(s)

In modeling for the various crops, the application(s) was/were aerial/foliar applications for labeled crop use patterns that include both aerial and ground; aerial application is expected to give higher exposure. Crops labeled for ground or air blast applications were modeled as per the labels.

Chemical and other parameters

No new fate and transport studies were submitted for fluopyram therefore the chemical parameters used for modeling were similar to all previous assessments and are summarized in **Table 4**. These parameters are as per the SWCC model input guidance².

Table 4 Summary of SWCC input parameters for modeling fluopyram

<i>Input Parameter (Unit)</i>	<i>Value</i>	<i>Reference (MRID No.)</i>
Molecular Weight g/mole	396.72	Product chemistry
K _{oc} (Average in L/Kg)	439	473723-01
Water Column Metabolism Half-life (days)	1,360	473723-11
Water Reference Temperature °C	20	
Benthic Metabolism Half-life (days)	1,757	473723-12/13
Benthic Reference Temperature °C	20	
Aqueous Photolysis Half-life (days)	57	473723-04
Photolysis Reference Latitude	40	
Hydrolysis Half-life (days)	Stable= 0	473723-03/07
Aerobic Soil Half-life (days)	464	473723-07 to 09
Soil Reference Temperature °C	25	
Vapor Pressure (VP in torr)	9.01 x 10⁻⁹	
Solubility in Water(mg/L)	16	Product chemistry
Henry's Law Constant (unitless)	1.20 x 10⁻⁸	Calculated from VP
Air Diffusion Coefficient (cm ² /day)	0.0	
Heat of Henry (J/mol)	0.0	Product chemistry
Application rate and intervals	Depends on the crop label	
Application Method		
Application Efficiency	95% for aerial and 99% for ground	
Spray Drift Fraction	Aerial (0.125); Ground (0.062) and Airblast (0.042)	

Modeling results

Tier II SWCC results for modeled seed treatment are summarized in **Table 5**.

² SWCC model input guidance: URL: <http://www.epa.gov/pesticides/science/efed/models/water/swcc/SWCC.pdf>

Table 5. Summary of modeled surface/pore waters and sediment **EECs** resulting from application of fluopyram as seed treatments (scenarios giving the highest EECs)

<i>Crop</i>	<i>Scenario</i>	<i>Surface Water (ppb)</i>			<i>Pore Water (ppb)</i>		<i>Sediment (µg/Kg dry)</i>	
		<i>Peak</i>	<i>21-day</i>	<i>60-day</i>	<i>Peak</i>	<i>21-day</i>	<i>Peak</i>	<i>21-day</i>
Cotton	STXcottonNMC	19.6	19.8	18.10	16.5	16.5	295	295
Soybeans	MSsoybeanSTD	15.8	15.5	15.20	14.7	14.7	263	263
Peanuts	NCpeanutSTD	7.9	7.8	7.66	7.15	7.15	128	128

Additionally, Tier II SWCC results for modeled crop uses are included in **Table 6**. The results included are for the highest exposure EECs resulting from fluopyram application to various crop/crop groups; representative scenario giving the highest EEC for the crop/crop group are only included.

Table 6 Highest EECs resulting from application of fluopyram to crops/crop groups

<i>Crop</i>	<i>Scenario (Giving the Highest EECs)</i>	<i>Surface Water (ppb)</i>			<i>Pore Water (ppb)</i>		<i>Sediment (µg/Kg dry)</i>	
		<i>Peak</i>	<i>21-day</i>	<i>60-day</i>	<i>Peak</i>	<i>21-day</i>	<i>Peak</i>	<i>21-day</i>
Artichoke	Artichoke	21.6	21.3	21.0	19.9	19.9	356	356
Beans & Peas	ILbeansNMC	47.8	47.0	46.2	44.4	44.4	795	795
Brassica Leafy Vegetables	CAColeCropRLF_V2	37.3	36.7	36.0	34.6	34.6	619	619
Bulb Vegetables	GAOnion_WirrigSTD	23.6	23.2	22.9	21.5	21.5	385	385
Canola	NDcanolaSTD	31.5	31.1	30.9	30.3	30.3	542	542
Carrot	FLcarrotSTD	40.2	38.3	36.4	33.0	32.6	591	584
Cereals: Corn and Sorghum	MScornSTD & KSCornStd	50.1	49.3	48.2	46.4	46.4	831	831
Cereals: Wheat & others	TXwheatOP	51.3	49.9	48.9	44.9	44.9	804	804
Christmas Trees	ORX-mass trees STD	6.9	6.8	6.7	6.4	6.4	115	115
Citrus	FLcitrusSTD	20.6	20.2	19.4	17.4	17.4	311	311
Cotton	STXcottonNMC & NCcottonSTD	31.7	30.7	30.5	29.8	29.8	533	533
Cucurbits	STXmelonNMC & FLCucumberSTD	39.2	38.2	36.2	32.4	32.5	580	582
Fruiting Vegetables	STXvegetableNMC & FLpeppersSTD	40.7	39.6	38.6	34.8	34.8	623	623
Ginseng	MNsugarbeetSTD	34.1	33.7	33.3	32.2	32.2	576	576
Grapes & Small Vine Fruits	NYGrapesSTD	19.6	19.4	19.2	19.0	19.0	340	340
Grasses for Forage/Seeds	ORgrasseedSTD	21.4	21.0	20.6	19.4	19.4	347	347
Herbs & Spices	CAColeCropRLF_V2	36.7	36.2	35.6	34.2	34.1	612	610
Hops	ORhopsSTD	24.0	23.7	23.5	22.9	22.9	410	410
Leafy Vegetables + Petiole	CAlettuceSTD	40.3	39.8	39.2	38.1	38.1	682	682
Legume Vegetables W/Soybeans	MSsoybeanSTD	37.6	37.2	37.1	35.4	35.4	634	634
Ornamentals: Residential	CAresidential/imperviousRLF	4.6	4.5	4.4	Not Determined (expect to be low)			
Ornamentals: Nurseries	MINurserySTD	29.6	29.3	29.4	28.4	28.4	508	508
Peanut	NCpeanutSTD	32.4	32.0	31.6	30.1	29.8	539	533
Pome Fruits	NCappleSTD	19.3	18.4	17.2	15.4	15.4	276	276
Potato, Tuberous/Corm Vegies	MEpotatoSTD	50.2	49.9	49.6	49.0	49.0	877	877

Crop	Scenario (Giving the Highest EECs)	Surface Water (ppb)			Pore Water (ppb)		Sediment (µg/Kg dry)	
		Peak	21-day	60-day	Peak	21-day	Peak	21-day
Small Berries	CAWineGrapesRLF_V2	13.3	13.4	13.1	12.5	12.5	224	224
Stone Fruits	MICherriesSTD	20.2	20.0	19.7	19.5	19.5	349	349
Strawberry	CAstrawberry –non-plasticRLF	40.7	40.0	39.1	36.4	36.3	652	650
Sugar beet	MNsugarbeetSTD	34.1	33.7	33.3	32.2	32.2	576	576
Sunflower	CAcornOP	18.1	17.8	17.6	16.9	16.9	303	303
Tree nuts	GAPecansSTD	21.2	21.2	21.3	21.0	21.1	376	378
Turf	PAturfSTD	16.5	16.2	15.8	15.6	15.6	279	279

IV. Effects Summary

Table 7 shows the acute and chronic effects data that were used for estimating risk to aquatic animals and plants.

Table 3. Toxicity reference values for aquatic organisms exposed to fluopyram technical or formulated fluopyram (Fluopyram SC 500A, 41.5% active ingredient).					
Exposure Scenario	% Active Ingredient	Species	Exposure Duration	Toxicity Reference Value	Reference Classification
Freshwater Fish					
Acute	TGAI	Rainbow Trout	96 hours	LC ₅₀ >1.78 mg a.i./L	MRID 47372328
	94.70%	<i>Oncorhynchus mykiss</i>		NOAEC=1.78 mg a.i./L	Acceptable
	TEP	Rainbow Trout	96 hours	LC ₅₀ >46.4 mg a.i./L ^b	MRID 47372333
	41.50%	<i>Oncorhynchus mykiss</i>		NOAEC=1.31 mg a.i./L	Supplemental
Chronic	TGAI	Fathead minnow <i>Pimephales promelas</i>	33 days	NOAEC = 0.135 mg a.i./L	MRID 47372336
	94.70%			LOAEC = 0.269 mg a.i./L	Acceptable
Freshwater Invertebrates					
Acute	TGAI	Water flea	48 hours	EC ₅₀ >17 mg a.i./L	MRID 47372324
	94.70%	<i>Daphnia magna</i>		NOAEC=17 mg a.i./L	Acceptable
	TEP	Water flea	48 hours	EC ₅₀ >38.2 mg a.i./L	MRID 47372325
	41.50%	<i>Daphnia magna</i>		NOAEC=11.6 mg a.i./L	Acceptable

Chronic	TGAI	Water flea	21 days	NOAEC = 1214 µg a.i./L	MRID 47372334
	94.70%	<i>Daphnia magna</i>		LOAEC = 2996 µg a.i./L	Acceptable
Estuarine/Marine Fish					
Acute	TGAI	Sheepshead minnow	96 hours	LC ₅₀ >0.98 mg a.i./L ^a	MRID 47372330
	94.70%	<i>Cyprinodon variegatus</i>		NOAEC=0.98 mg a.i./L	Acceptable
Chronic	No Data				
Estuarine/Marine Invertebrates					
Acute	TGAI	Saltwater mysid	96 hours	EC ₅₀ >0.51 mg a.i./L	MRID 47372327
	94.70%	<i>Americamysis bahia</i>		NOAEC=0.27 mg a.i./L	Acceptable
Chronic	No Data				
Freshwater Benthic Invertebrates					
Acute	No Data				
Chronic	TGAI	Midge	54 days	<u>Sediment concentrations</u>	MRID 47372339
	94.70%	<i>Chironomus tentans</i>		NOAEC = 26 mg a.i./kg sediment	Supplemental
				LOAEC = 48 mg a.i./kg sediment	
				<u>Pore water concentrations</u>	
				NOAEC = 3.8 mg a.i./L pore water	
			LOAEC = 8.8 mg a.i./L pore water		
Estuarine/Marine Benthic Invertebrates					
Acute	TGAI	Saltwater amphipod	10 days	<u>Sediment value:</u>	MRID 47372338
	94.70%	<i>Leptocheirus plumulosus</i>		LC50 > 100 mg a.i./kg sediment	Acceptable

				NOAEC=100 mg a.i./kg sediment <u>Pore water value:</u> LC ₅₀ > 7.5 mg a.i./L pore water NOAEC = 7.5 mg a.i./L pore water	
Chronic	TGAI	Saltwater amphipod	28 days	<u>Sediment concentrations</u> NOAEC = 36 mg TRR/kg sediment LOAEC = 92 mg TRR/kg sediment <u>Pore water concentrations</u> NOAEC = 2.5 mg TRR/L pore water LOAEC = 5.9 mg TRR/L pore water	MRID 47372335 Supplemental
	94.70%	<i>Leptocheirus plumulosus</i>			
Aquatic Plants					
	TGAI			EC ₅₀ = 4.3 mg a.i./L	MRID 47372403
	94.70%	<i>Pseudokirchneriella subcapitata</i>	96 hours	NOAEC = 1.46 mg a.i./L (biomass)	Acceptable
	TEP			EC ₅₀ = 3.4 mg a.i./L	MRID 47372407
	41.50%	<i>Pseudokirchneriella subcapitata</i>	72 hours	NOAEC = 1.17 mg a.i./L (cell density)	Acceptable
	Fluopyram-lactame (metabolite)	<i>Pseudokirchneriella subcapitata</i>	72 hours	EC ₅₀ >8.87 mg a.i./L	MRID 47372418

	94%			NOAEC = 8.87 mg a.i./L (for both cell density and growth rate)	Acceptable
Macrophyte	TGAI	Duckweed		EC ₅₀ = 2.6 mg a.i./L	MRID 47372401
	94.70%	<i>Lemna gibba</i>	7 days	NOAEC = 0.28 mg a.i./L (frond number based on yield)	Acceptable
	TEP	Duckweed		EC ₅₀ = 2.9 mg a.i./L	MRID 47372402
	41.60%	<i>Lemna gibba</i>	7 days	NOAEC = 1.04 mg a.i./L (frond number based on yield)	Acceptable
^a These values were used for evaluation of risk via spray drift only.					

Table 8 shows the acute and chronic effects data that were used for estimating risk to terrestrial animals and plants.

Table 4. Toxicity reference values for terrestrial organisms exposed to fluopyram technical or formulated fluopyram (Fluopyram SC 500A, 41.5% active ingredient).					
Exposure Scenario	% Active Ingredient	Species	Exposure Duration	Toxicity Reference Value	Reference
Mammals					
Acute	TGAI	Laboratory Rat			MRID
	(94.7% a.i.)	(<i>Rattus norvegicus</i>)	Single oral dose	LD ₅₀ > 2000 mg a.i./kg bw	47372430
					Acceptable
Chronic	TGAI	Laboratory Rat (<i>Rattus norvegicus</i>)	90-day dietary study	NOAEL = 13 mg a.i./kg bw/day	MRID 47372441

	(94.7% a.i.)			LOAEL = 61 mg a.i./kg bw/day	Acceptable
Birds					
Acute	TGAI (94.5% a.i. [bobwhite] and 94.7% a.i. [zebra finch]).	Northern bobwhite quail (<i>Colinus virginianus</i>) and zebra finch (<i>Taeniopygia guttata</i>)	Single oral dose	LD ₅₀ >2000 mg a.i./kg bw	MRIDs 47372341 Acceptable and 47567007 Supplemental
Acute	TGAI (95.0% a.i.)	Northern bobwhite quail (<i>Colinus virginianus</i>)	5-Day dietary	LC ₅₀ >4785 mg a.i./kg diet	MRID 47372343 Acceptable
Chronic	TGAI (94.7% a.i.)	Bobwhite quail (<i>Colinus Virginianus</i>) and Mallard duck (<i>Anas platyrhynchos</i>)	Avian reproduction study (dietary exposure, one generation)	NOAEC = 46.7 mg a.i./kg diet ^a LOAEC = 75.7 mg a.i./kg diet ^a	MRIDs 47372344 Acceptable 47372345 Supplemental 47372346 Acceptable
Terrestrial Insects					
Acute	TGAI	Honey bee	96-Hour acute	<u>Contact toxicity</u>	MRID 47372347

	(95.5% a.i.)	(<i>Apis mellifera</i>)	contact and oral toxicity test	LD ₅₀ >100 µg test material/bee	Contact toxicity test: Acceptable
				<u>Oral toxicity</u>	
				LC ₅₀ >102.3 µg test material/bee	
Acute	TEP	Honey bee	96-Hour acute contact and oral toxicity test	<u>Contact toxicity</u>	MRID 47372348
	(41.6% a.i.)	(<i>Apis mellifera</i>)		LD ₅₀ > 83.2 µg a.i./bee	Contact toxicity test:
				<u>Oral toxicity</u>	Acceptable
				LC ₅₀ > 89 µg a.i./bee	
Plants - Tier I seedling emergence					
Monocot	TEP	Oat (<i>Avena sativa</i>), perennial ryegrass (<i>Lolium perenne</i>), barley (<i>Hordeum vulgare</i>) and corn (<i>Zea mays</i>)	Single application at test initiation	EC ₂₅ >0.444 lbs a.i./A	MRID 47372349
	(41% a.i.)			NOAEC = 0.444 lbs a.i./A	Acceptable
Dicot	TEP	Sugarbeet (<i>Beta vulgaris</i>), oilseed rape (<i>Brassica napus</i>), soybean (<i>Glycine max</i>), cucumber (<i>Cucumis sativus</i>), buckwheat (<i>Fagopyrum esculentum</i>) and sunflower (<i>Helianthus annuus</i>)	Single application at test initiation	EC ₂₅ <0.444 lbs a.i./A	MRID 47372349
	(41% a.i.)			NOAEC <0.444 lbs a.i./A	Acceptable
Plants - Tier II seedling emergence					
Dicot	TEP	Buckwheat	Full test	EC ₂₅ <0.444 lbs a.i./A	MRID* 48934301

	(42% a.i.)	(<i>Fagopyrum esculentum</i>)		NOAEC 0.444 lbs a.i./A	Supplemental
Plants - Tier I vegetative vigor					
Monocot	TEP (41% a.i.)	Onion (<i>Allium cepa</i>), oat (<i>Avena sativa</i>), perennial ryegrass (<i>Lolium perenne</i>) and corn (<i>Zea mays</i>)	Single application at test initiation	EC ₂₅ >0.222 lbs a.i./A NOAEC = 0.222 lbs a.i./A	MRID 47372350 Acceptable
Dicot	TEP (41% a.i.)	sugarbeet (<i>Beta vulgaris</i>), oilseed rape (<i>Brassica napus</i>), cucumber (<i>Cucumis sativus</i>), buckwheat (<i>Fagopyrum esculentum</i>), soybean (<i>Glycine max</i>) and sunflower (<i>Helianthus annuus</i>)	Single application at test initiation	EC ₂₅ >0.222 lbs a.i./A NOAEC = 0.222 lbs a.i./A	MRID 47372350 Acceptable

*Bolded MRID indicates newly submitted study for this assessment.

In response to a supplemental study examining seedling emergence on the dicot buckwheat, an additional seedling emergence study was submitted (MRID 48934301). This study was scientifically sound but because this study only examined the dicot buckwheat it is considered supplemental. It does however fulfill the guideline requirements when combined with the previously submitted seedling emergence study (MRID 47372349). At the application rates of 0.444 lb a.i. /A buckwheat had inhibitions in emergence and survival of up to 5.4%; however there was also a slight promotion shoot length and overall no general trend was observed. The maximum inhibition in dry weight was 1.9%, but was observed with promotion of dry weight as well. There was no effect in the negative control or any treatment group and the NOAEC was established as 0.444 lb a.i. / A.

V. Risk Estimation

A. Risk Estimation for Aquatic Animals

Risks to aquatic animals from the proposed use of fluopyram are summarized in **Appendix 2**. For freshwater animals, no acute or chronic risks were identified either for listed or non-listed species. Acute RQs for freshwater fish and invertebrates were all less than 0.03 and did not exceed the level of concern for either listed (LOC=0.1) or Nonlisted species (LOC=0.5). Chronic fish RQs were all less than 0.36 and chronic invertebrate RQs were all less than 0.04, and did not exceed the chronic LOC of 1.0. Acute RQs for estuarine/marine fish were all less than 0.05 and did not exceed either listed or Nonlisted LOCs. Acute RQs for estuarine/marine invertebrates ranged from <0.1 (three crop groups: cereals (corn and sorghum), cereals (wheat and others), and Potato and tuberous/corm vegetables) to <0.01 and did not exceed either the listed species LOC (0.1) or the nonlisted species LOC (0.5). No chronic toxicity data are available for estuarine/marine invertebrates or fish. When possible the Agency uses the acute to chronic ratio (ACR) to bridge missing toxicity data in establishing potential risk to taxa with missing data. In this case establishing an ACR was not possible due to non-definitive endpoints in the taxa where data did exist. Chronic RQs for sediment invertebrates were all less than 0.03 and did not exceed the LOC of 1.0 for either freshwater or estuarine/marine invertebrates from either porewater or sediment exposure. Given the EECs that were generated from the modeled uses, it is reasonable to expect that aquatic animals are at low risk from the proposed uses which is similar to the established uses covered in the previous assessment on fluopyram (US EPA 2011).

B. Risk Estimation for Aquatic Plants

RQs for nonlisted species of both vascular and nonvascular plants were 0.02 or less and did not exceed the LOC of 1.0. RQs for listed species of vascular and nonvascular plants also did not exceed the LOC of 1.0. RQs for listed species of vascular aquatic plants ranged from 0.02 to 0.18 while RQs for listed nonvascular plants ranged from 0.01 to 0.04. These are consistent with the low risk determinations in previous assessments. The RQs are presented in Appendix 2.

C. Risk Estimation for Terrestrial Animals

Risks to terrestrial animals were assessed for both spray applications as well as seed treatments. In-furrow applications were also assessed in the previous assessment.

Spray Applications

Terrestrial EECs could be an underestimation of actual exposure concentrations in the environment. Although the label stated that fluopyram can be applied via foliar spray application up to 2 times *per season* for the crops with the highest seasonal application rate (watermelons, and strawberries), for this risk assessment, EFED assumed that fluopyram was applied at a maximum of 2 times *per year* (**Table 9**). If there are conditions under which there is more than

one growing season for a crop within a single year, exposure estimates and risk to terrestrial organisms could be significantly underestimated.

Table 9. Input parameters used in T-REX v1.4.1 to determine terrestrial EECs for the maximum fluopyram spray application scenario. ^a		
Input Variable	Parameter Value	Source
Maximum application rate	0.25 lbs a.i./A	T-REX Default Value
Maximum # of applications per year	2	
Minimum application interval	5 days	
Foliar half-life	35 days	
^a Representative of the maximum exposure scenario for all crop uses.		

The EECs on food items may be compared directly with dietary toxicity data or converted to an oral dose. For mammals, the residue concentration is converted to daily oral dose based on the fraction of body weight consumed daily as estimated through mammalian allometric relationships. The screening-level risk assessment for fluopyram considers upper-bound predicted residues as the measure of exposure. Summaries of the predicted upper-bound and mean residues of fluopyram that may be expected to occur on selected avian or mammalian food items immediately following application for the maximum use scenario are presented in **Table 10**.

For the maximum fluopyram spray application scenario, acute concentrations on foliar surfaces ranged from 7 to 114 ppm for upper-bound residues and 3 to 41 ppm for mean residues. These residues are very similar to those modeled in the 2011 assessment (DP Barcode: D352215) with maximum application rates of 0.222 lbs a.i./A.

Table 10. Upper-bound and mean terrestrial dietary EECs estimated for the maximum fluopyram spray application scenario (Kenaga values). ^a		
Forage Type	Upper-bound Residues (ppm)	Mean Residues (ppm)
Short Grass	114	41
Tall Grass	52	17
Broadleaf plants	64	21
Fruits/pods/seeds	7	3
Arthropods	45	31

Spray Applications: Acute Risk to Birds and Mammals

Birds

Previous assessments did not calculate acute dose- or dietary-based RQs for birds because definitive LD₅₀ and LC₅₀ values were not available. Utilization of the endpoint (LD₅₀ > 2000 mg/kg bw; MRID 47372341) however indicate that the RQs would be less than 0.09 for the most conservative assumption using upper bound residues suggesting that there is low acute risk to birds from applications of fluopyram at the maximum application rates.

Mammals

Previous assessments did not calculate acute dose-based RQ values for mammalian receptors because the results of the definitive submitted acute oral toxicity studies on mammals did not allow calculation of a definitive LD₅₀ values. Utilization of the endpoint (LD₅₀ > 2000 mg/kg bw; MRID47372430) however indicate that the RQs would be less than 0.02 for the most conservative assumption using upper bound residues suggesting that there is low acute risk to mammals from applications of fluopyram at the maximum application rates.

Spray applications: Chronic Risk to Birds and Mammals

Birds

For birds, chronic RQs were derived using a dietary-based chronic toxicity value. Dietary-based RQs were calculated using EECs expressed in terms of residue concentration for the various forage categories, and the toxicity value (NOAEC) is expressed in units of dietary concentration (**Table 11**). RQs exceeded the LOC of 1.0 for all dietary categories except for fruits/pods/seed and indicated the potential for adverse effects from chronic exposure to short grass, tall grass, broadleaf plants and arthropods.

Table 11. Dietary-based chronic RQs for birds exposed to fluopyram based on upper-bound residues on short grass, tall grass, broadleaf plants/small insects, and fruits/pods/seeds/large insects as calculated by T-REX	
Dietary item	Avian Chronic Risk Quotients ^a
Short Grass	2.4
Tall Grass	1.1

Broadleaf plants	1.4
Fruits/pods/seeds	0.2
Arthropods	1.0
^a These values were calculated using the maximum application rate (0.25 lb a.i./A), the maximum number of applications (2), the minimum application interval (5 days), and a chronic NOAEC = 46.70 mg a.i./kg diet in bobwhite quail and a default chemical foliar half-life of 35 days.	

Bolded values denote RQ values that exceed the LOC of 1.0

Mammals

Dietary-based RQs were calculated using EECs expressed in terms of residue concentration for the various forage categories, and the toxicity value (NOAEC) is expressed in units of dietary concentration. Dose-based RQs were calculated using EECs expressed in terms of a dose concentration for the various forage categories and the estimated toxicity value (NOAEL). The dose-based EECs are calculated by using the estimated dietary concentrations and assuming the laboratory rat consumes 5% of its body weight daily. Three weight categories (or sizes) were considered for dose-based risk calculations (**Tables 12 and 13**). Chronic RQs for mammals exceeded the LOC of 1.0 for dose based exposure but not dietary based exposure. Chronic risk was found from dosed based exposure to short grass, tall grass, broadleaf plants and arthropods for both small and medium sized birds. Exposure to short grass had the potential to adversely affect large birds.

Table 12. Dose-based chronic RQs for small (15g), intermediate (35g), and large (1,000g) mammals exposed to fluopyram based on upper-bound residues on short grass, tall grass, broadleaf plants/small insects, fruits/pods/large insects and seeds as calculated by T-REX						
Mammalian Chronic Risk Quotient*						
Body Weight	Short Grass	Tall Grass	Broadleaf Plants	Fruits/Pods	Arthropods	Seeds
(g)						
15	3.82	1.75	2.15	0.24	1.49	0.05
35	3.26	1.49	1.83	0.20	1.28	0.05
1000	1.75	0.80	0.98	0.11	0.68	0.02

* These values were calculated using the maximum application rate (0.25 lb a.i./A), the maximum number of applications (2), the minimum application interval (5 days), a NOAEC = 13 mg a.i./kg body weight/day in rats and an estimated chronic dietary NOAEC = 260 mg ai/kg diet and a default chemical foliar half-life of 35 days.

Bolded values denote RQ values that exceed the LOC of 1.0

Table 13. Dietary-based chronic RQs for mammals exposed to fluopyram based on upper-bound residues on short grass, tall grass, broadleaf plants/small insects, and fruits/pods/seeds/large insects as calculated by T-REX

Mammalian Chronic Risk Quotients*				
Short Grass	Tall Grass	Broadleaf Plants	Fruits/Pods/Seeds	Arthropods
0.44	0.20	0.25	0.03	0.17
* These values were calculated using the maximum application rate (0.25 lb a.i./A), the maximum number of applications (2), the minimum application interval (5 days), and a chronic NOAEC = 13 mg a.i./kg body weight/day in rats and an estimated chronic dietary NOAEC = 260 mg ai/kg diet and a default chemical foliar half-life of 35 days..				

a) Seed treatments on soybeans and cotton and peanuts

Risks to both avian and mammalian taxa from seed treatments for peanuts, soybeans and cotton are presented in **Table 14**. The risks from soybeans and cotton were assessed previously (DP Barcode 414232).

For peanuts, the seed treatment resulted in an acute risk to listed small and medium sized avian species as well as chronic risk to both listed and non-listed species of birds and mammals in all weight classes. An RQ of 0.26 in the avian 20 g category and of 0.12 in the 100 g category exceeded the acute listed species LOC of 0.1 indicating listed species in these weight class may be adversely affected by acute exposures. Avian chronic RQs were 32 and exceeded the LOC of 1.0 for chronic exposure. Mammalian chronic RQs ranged from 5 to 11, all exceeding the chronic LOC of 1.0, indicating potential chronic adverse effects when exposed to fluopyram through peanut seed treatments. There was not any mammalian acute risk identified for any mammalian weight class exposed to peanut seed treatments.

For soybeans, the seed treatment resulted in an acute risk to listed avian species as well as

chronic risk to both listed and non-listed species of birds and mammals in all weight classes. An RQ of 0.14 in the avian 20 g category exceeded the acute listed species LOC of 0.1 indicating listed species in this weight class may be adversely affected by acute exposures. Avian chronic RQs were 17.65 and exceeded the LOC of 1.0 for chronic exposure. Mammalian chronic RQs ranged from 2.8 to 6.11, all exceeding the chronic LOC of 1.0, indicating potential chronic adverse effects when exposed to fluopyram through soybean seed treatments. There was not any mammalian acute risk identified for any mammalian weight class exposed to soybean seed treatments.

For the cotton seed treatment there was potential risk to avian taxa identified on both an acute and chronic basis. The avian weight class of 20g had an RQ of 0.61 and exceeded the nonlisted species LOC of 0.5 suggesting potential adverse effects to both listed and non-listed avian species in this weight class. The avian weight class of 100 g had a RQ of 0.27 which exceeded the LOCs for listed species (LOC= 0.1). This suggests that listed species may potentially be adversely affected and risks may be mitigated through restricted use patterns. Chronic risk was identified in all avian weight classes with an RQ of 74.11 in each category greatly exceeding the chronic LOC of 1.0. The mammalian weight classes of 15g and 35g had RQs of 0.17 and 0.14 respectively for cotton. These both exceed the LOC for listed species (0.1) and indicate potential adverse effects to listed species on an acute exposure basis when exposed to cotton seed treatments. Chronic mammalian RQs ranged from 11.75 to 25.66 and all significantly exceeded the chronic LOC of 1.0 indicating risk to both listed and non-listed species.

Table 14. Risk quotients for terrestrial animals as a result of seed treatments on peanuts, soybean and cotton.

Risk Quotients†			
Peanuts			
	Acute (# 1)	Acute (# 2)	Chronic
Avian (20 g)	0.26	0.01	32.04
Avian (100 g)	0.12	0.00	32.04
Avian (1000 g)	0.04	0.00	32.04
Mammalian (15 g)	0.07	0.00	11.09
Mammalian (35 g)	0.06	0.00	9.48
Mammalian (1000 g)	0.03	0.00	5.08
Soybean			
	Acute (# 1)	Acute (# 2)	Chronic
Avian (20 g)	0.14	0.01	17.65
Avian (100 g)	0.06	0	17.65
Avian (1000 g)	0.02	0	17.65
Mammalian (15 g)	0.04	0	6.11
Mammalian (35 g)	0.03	0	5.22
Mammalian (1000 g)	0.02	0	2.8

Cotton			
	Acute (# 1)	Acute (# 2)	Chronic
Avian (20 g)	0.61	0.02	74.11
Avian (100 g)	0.27	0	74.11
Avian (1000 g)	0.09	0	74.11
Mammalian (15 g)	0.17	0.01	25.66
Mammalian (35 g)	0.14	0.01	21.92
Mammalian (1000 g)	0.08	0	11.75
Acute RQ #1 = (mg ai /kg-bw/day) / LD50 Acute RQ #2 = mg ai ft-2 /(LD50*bw) Avian Chronic RQ =mg kg-1 seed / NOAEL Mammalian Chronic RQ = mg a.i./kg-bw/day / adjusted NOAEL			

Bolded values denote RQ values that exceed the acute listed species LOC of 0.1 and the chronic LOC of 1.0

D. Risk Estimation for Terrestrial Plants

As reviewed in the previous assessment, in the vegetative vigor study, sugarbeet had the highest level of inhibition in dry weight, a 20.2% reduction in comparison to the negative control at a fluopyram application rate of 0.222 lbs a.i./A. The rate applied in the Tier I seedling emergence test, 0.444 lbs a.i./A, was greater than the maximum application rate of 0.25 lbs a.i./A. The original buckwheat study submitted for the previous risk assessment showed a 50.4% reduction in dry weight at 0.444 lbs a.i./A in the seedling emergence test (MRID 47372349; US EPA 2011). A more recent Tier II study submitted for this assessment (MRID 48934301) demonstrated that there were not any observable effects at the maximum application rates of 0.44 lb a.i./A. The NOAEC for this study was 0.4440 lb a.i./A.

A preliminary run of TERR-PLANT was conducted using the maximum application scenarios for ground application listed in **Table 2**. All EECs ranged from 0.0025 (spray drift) to 0.0525 (semi-aquatic areas) lbs a.i./A for ground applications. In all scenarios used in this assessment, there was not any risk identified to either listed or non-listed monocots and dicots in dry and semi-aquatic areas as a result of runoff or spray drift (RQs ranged from <0.1 to 0.12). Similarly, the in-furrow treatments also did not exceed the LOC of 1.0. Use of Fluopyram is unlikely to adversely affect terrestrial plants when used according to labels.

VI. Risk Summary

The RQs are summarized in the above tables. Risk associated with the proposed new uses of fluopyram are confined primarily to terrestrial taxa. For spray applications there was chronic dietary based risk from consumption of all dietary categories but the fruit/pods/seeds category. Spray applications also resulted in chronic dosed-based risk to mammalian taxa in every size class for short grass for most dietary items for small and medium sized mammals. Exposure to

Fluopyram via seed treatments potentially poses acute risk to small and medium sized endangered avian and mammalian species. There was chronic risk indicated for both avian and mammalian taxa from all seed treatments.

Citations:

US. EPA 2011. Environmental Fate and Ecological Risk Assessment for Fluopyram Registration (PC Code 080302; DP Barcodes 353315, 369756, and 385637)

Appendix I: Labeled uses for fluopyram and mixtures

(1) Abbreviations

A	Application using aerial equipment
AirBlast	Application using air blast equipment
C	Chemigation through the irrigation systems
CG	Crop Group
CR	Crop
D	Drench application to soil
-d	Application intervals in days (e.g., 7-d)
F	Application directed to foliage
FDC	Fungicide Disease Control
FDS	Fungicide Disease Suppression
G	Application using ground equipment
MSA	Maximum Single Rate (lb a.i./A)
MYA	Maximum Yearly Rate (lb a.i./A)
NPC	Nematode Pest Control
PHI	Pre-harvest interval (days)
S	Application directed to soil

- (2) **Products:** Products are numbered from 1 to 11 in the Tables, below and hereunder the names and active ingredient(s) for these products

Products Names and active(s)

Product No.	Product Name and Active Ingredient(s)
1	FLUOPYRAM 500 SC: a.i: Fluopyram
2	LUNA® PRIVILEGE: a.i: Fluopyram
3	PROPULSE™: a.i: Fluopyram & Prothioconazole
4	LUNA® TRANQUILITY: Fluopyram & Pyrimethanil
5	LUNA® EXPERIENCE: Fluopyram & Tebuconazole
6	LUNA® SENSATION: Fluopyram & Trifloxystrobin
7	FLU+TFS SC 25: a.i: Fluopyram + Trifloxystrobin

8	FLU+TFS SC 32.5: a.i: Fluopyram + Trifloxystrobin
9	FLU+TFS SC 500: a.i: Fluopyram + Trifloxystrobin
10	13ESP715 3.3 SC: a.i: Fluopyram (master label: Fungicide + Nematicide)
11	13ESP715 3.3 SC: a.i: Fluopyram (Nematicide only)

Table I-1 Artichoke, Beans and Peas, Brassica and Bulb vegetables (refer to **Abbreviations**, above)

CR or CG	Crops	Product	Purpose
Artichoke	Artichoke (globe) MSA= Maximum Single Application MSA= 0.223; Maximum Yearly Application (MYA)= 0.446; 7-d; Soil or Foliar (S or F); G/A/C/D (ground/aerial/chemigation/Drip): MSA= 0.223 ; MYA= 0.446; 7-d; S or F; G/A/C/D; PHI=0	2	FDC
	Artichoke (globe): MSA= 0.125; MYA= 0.251; 7-d; S or F; G/A/C; PHI=0	6	FDC +FDS
Beans and Peas (dried)	Bean (<i>Lupinus</i> spp., includes grain lupin, sweet lupin, white lupin, and white sweet lupin), Bean (<i>Phaseolus</i> spp., includes field bean, kidney bean, lima bean, navy bean, pinto bean, tepary bean), Bean (<i>Vigna</i> spp., includes adzuki bean, blackeyed pea, catjang, Crowder pea, moth bean, mung bean, rice bean, southern pea, urd bean, Broad Bean (dry), Chickpea, Guar, Lablab Bean, Pea (<i>Pisum</i> spp Pea including Field pea and Pigeon pea), Lentil MSA= 0.178; MYA= 0.446; 7-d; S or F; G/A/C; PHI=14	3	FDC
	Beans only: fresh & dry, except succulent shelled: MSA= 0.167; MYA= 0.334; 10-d; S or F; G/A/C; PHI=14	5	FDC
Brassica (Cole) Leafy Vegetables	Broccoli, Broccoli raab (rapini), Brussels sprouts, Cabbage, Cauliflower, Cavalo broccolo, Chinese broccoli (gai lon), Chinese cabbage (bok choy), Chinese cabbage (napa), Chinese mustard cabbage (gai choy), Collards, Kale, Kohlrabi, Mizuna, Mustard greens, Mustard spinach, Rape greens, Turnip greens. Including all cultivars and/or hybrids of these: FDC: MSA= 0.223; MYA= 0.446; 5-d; S or F; G/A/C/D; PHI= 0 and NPC: MSA= 0.223; MYA= 0.446; 5-d; For application refer to Note 1	2	FDC + NPC
	Crop Subgroup 5B: Broccoli raab (rapini), Chinese cabbage (bok choy), Collards, Kale, Mizuma, Mustard greens, Mustard spinach, Rape greens, Turnip greens and/or hybrids of these: MSA= 0.112; MYA= 0.444; 7-d; S or F; G/A/C/D; PHI= 7	5	FDC + FDS
	BRASSICA LEAFY VEGETABLES, (HEAD AND STEM SUBGROUP) Broccoli, Chinese broccoli (gai lon), Brussels sprouts, Cabbage, Chinese cabbage (napa), Chinese cabbage (bok choy), Chinese mustard cabbage (gai choy), Cauliflower, Cavalo broccolo, Kohlrabi; Including all cultivars and/or hybrids of these: MSA= 0.125; MYA= 0.251; 7-d; S or F; G/A/C/D; PHI= 0	6	FDC + FDS
	BRASSICA LEAFY VEGETABLES, (LEAFY GREENS SUBGROUP 5B): Same crops listed for product 5: MSA= 0.125; MYA= 0.251; 7-d; S or F; G/A/C; PHI= 0	6	FDC + FDS
Bulb Vegetables	Chive fresh leaves, Chive fresh leaves (Chinese), Daylily bulb, Elegans hosta, Fritillaria (bulb and leaves), Garlic bulb, Garlic bulb (Great headed and Serpent), Kurrat, Leek, Leek (Lady's and Wild), Lily bulb, Onion (Beltsville bunching, Bulb, Chinese bulb, Fresh, Green, Macrostem, Pearl, Potato bulb, Tree tops, and Welsh), Shallot (bulb and fresh leaves). Including all cultivars and/or hybrids of these: MSA= 0.223; MYA= 0.446; 5-d; S or F; G/A/C; PHI=0	2	FDC + FDS
	Dry bulb onion, Eschalots, Green onion, Garlic, Leeks, Japanese bunching onion, Scallions, Shallot, Spring onion 0.220-0.445/7-d G/A/AB/C: MSA= 0.220; MYA= 0.444000; 7-d; S or F; G/A/C; PHI= 7 (up to 0.446)	4	FDC + FDS
	Same crops as product 1: MSA= 0.167; MYA= 0.434; 10-d; S or F; G/A/C; PHI= 7	5	FDC + FDS

Note 1: Varies by crop: applied chemical is to reach the root zone by irrigating-in, drench, and chemigation or in seed-furrow

Table I-2 Canola, Carrots, Cereal grains and X-mass trees (refer to **Abbreviations**, above)

<i>CR or CG</i>	<i>Crops</i>	<i>Product</i>	<i>Purpose</i>
Canola Subgroup	Borage; crambe; cuphea; echium; flax seed; gold of pleasure; hare's ear mustard; lesquerella; lunaria; meadowfoam; milkweed; mustard seed; oil radish; poppy seed; rapeseed; sesame; sweet rocket cultivars, varieties; and/or hybrids of these: MSA= 0.223 ; MYA= 0.446; 12-d; S or F; G/A/C; PHI= 14 d	2	FDC
	Canola, Rapeseed, Indian rapeseed, Field mustard and Crambe: MSA= 0.178; MYA= 0.356; 14-d; S or F; G/A/C; PHI= 36 (up to 0.446 w/other)	3	FDC
Carrot	Tops or greens may be utilized for food or feed. Beet (garden), Burdock (edible), Celeriac, Chervil (Turnip-rooted), Chicory, Horseradish, Parsley (Turnip-rooted), Parsnip, Radish, Oriental Radish (Daikon), Rutabaga, Salsify, Salsify (Black and Spanish), Skirret, Turnip: MSA= 0.223 ; MYA= 0.446; 5-d; Assume Foliar; G/A/C; PHI= 7 d	2	FDC
	Carrot: MSA= 0.125 ; MYA= 0.377; 14-d; Assume Foliar; G/A/C; PHI= 7 d	6	FDC + FDS
Cereal Grains, Except Rice	Crops: Barley, Buckwheat, Corn (sweet corn, field corn, field corn grown for seed, and popcorn), Millet (pearl and proso), Oats, Popcorn, Rye, Sorghum, Sudan grass, Teosinte, Triticale, Wheat Plus: Forage, Fodder or Straw from al cereal grain crops stated above: MSA= 0.223; MYA= 0.446; 14-d; S or F; G/A/C; PHI= 14 d	2	FDC
	Barley, Wheat (spring, durum, and winter) and Triticale (0.178-0.294/ 14-d) G/A/C MSA= 0.178; MYA= 0.296; 14-d; S or F; G/A/C; PHI= 30 d (with other=0.446)	3	FDC
	Buckwheat, Millet (pearl and proso), Oats and Rye (0.178 One application) G MSA= 0.178 One application; S or F; G/A/C; PHI= 30 d (with other=0.446)	3	FDC
	Corn (Assume All): MSA= 0.178; MYA= 0.446; 7-d; S or F; G/A/C; PHI= 14 d for sweet corn	3	FDC
	Wheat and Barley: MSA= 0.122; ^{one} application; S or F; G/A/C; PHI= 30 d	5	FDC
	Corn: sweet corn, field corn, field corn grown for seed, and popcorn: MSA= 0.167; MYA= 0.334; 14-d; S or F; G/A/C; PHI= sweet corn= Min 7 fodder, field corn, field corn grown for seed, and popcorn Min 14 days	5	FDC
	Wheat: MSA= 0.112; MYA= 0.220; 14-d; S or F; G/A/C; PHI= 35 d (with other=0.446)	6	FDC
Christmas Trees	Christmas Trees: MSA= 0.221; MYA= 0.446; 7-d; F; AirBlast	2	FDP
	Christmas Trees: MSA= 0.220; MYA= Not specified but assumed to be 0.446; 7-d; F; AirBlast	7	FDC
	Christmas Trees: MSA= 0.220; MYA= Not specified but assumed to be 0.446; 7-d; F; AirBlast	9	FDC
	Christmas Trees: MSA= 0.224; MYA= 0.446; 7-d; F; AirBlast	10	FDC

Table I-3 Citrus, Cotton and Cucurbits (refer to Abbreviations, above)

CR or CG	Crops	Product	Purpose
Citrus	Australian desert lime, Australian finger-lime, Australian round lime, Brown River finger lime, Calamondin, Citron, Citrus hybrids, Grapefruit, Japanese summer grapefruit, Kumquat, Lemon, Lime, Mediterranean mandarin, Mount white lime, New Guinea wild lime, Orange (Sour and Sweet), Pummelo, Russell River lime, Satsuma mandarin, Sweet lime, Tachibana orange, Tahiti lime, Tangelo, Tangerine (Mandarin), Tangor, Trifoliate orange, Uniq fruit, White sapote, (<i>Casimiroa</i> spp.) and cultivars, varieties, and/or hybrids of these: FDC: MSA= 0.223; MYA= 0.446; 7-d; S or F; G/A/C; PHI= 7 d and NPC: MSA= 0.223; MYA= 0.446; 30-d; For application refer to Note 1; PHI= 7 d	2	FDC + NPC
	Non-bearing citrus trees: MSA= 0.221; MYA= 0.446; 7-d; F; AirBlast Drip	1	FDC
	Non-bearing trees: MSA= 0.221; MYA= 0.446; 30-d; For application refer to Note 1	1	NPC
	Lemons: MSA= 0.220 one application; S or F; G/A/C; PHI= 7 d (up to 0.446)	4	FDS
	Calamondin, Citrus citron, Citrus hybrids (<i>Citrus</i> spp., includes chironja, tangelo and tangor), Grapefruit, Kumquat, Lemon, Lime, Mandarin (tangerine), Orange (sweet and sour), Pummelo, Tangelo, Satsuma mandarin, White sapote (<i>Casimiroa</i> spp.), and other cultivars and/or hybrids of these: MSA= 0.125; MYA= 0.446 (0.448?); 7-d; S or F; G/A/C; PHI= 7 d (up to 0.446)	6	FDC
	Non-bearing citrus trees: MSA= 0.125; MYA= 0.445; 7-d; F; AirBlast	7	FDC
	Non-bearing citrus trees: MSA= 0.125; MYA= 0.445; 7-d; F; AirBlast	9	FDC
	Non-bearing citrus trees: MSA= 0.224; MYA= 0.446; 7-d; F; AirBlast	10	FDC
	Includes cultivars, varieties and other hybrids of these: FDC: MSA= 0.223 (one appl. Foliar); S or F; G/A/C; PHI= 30 d and NPC: MSA= 0.223 (one appl. Foliar); For application refer to note 1; PHI= 30 d	2	FDC + NPC
	Cotton: FDC: MSA= 0.222; MYA= 0.444; 7-d; S or F; G/A/C; PHI= 30 d	5	FDC
Cucurbit Vegetables	Chayote (fruit), Chinese waxgourd (Chinese preserving melon), Citron melon, Cucumber, Gherkin, Gourd (edible, includes hyotan, cucuzza, hechima, Chinese okra), <i>Momordica</i> spp. (includes balsam apple, balsam pear, bitter melon, Chinese cucumber), Muskmelon (hybrids and/or cultivars of <i>Cucumis melo</i> including true cantaloupe, cantaloupe, casaba, Crenshaw melon, golden pershaw melon, honeydew melon, honey balls, mango melon, Persian melon, pineapple melon, Santa Claus melon, snake melon), Pumpkin, Squash (includes summer squash types such as: crookneck squash, scallop squash, straightneck squash, vegetable marrow, zucchini, and winter squash types such as acorn squash, butternut squash, calabaza, Hubbard squash, spaghetti squash), Watermelon (includes hybrids and/or varieties of <i>Citrullus lanatus</i>): FDC: MSA= 0.223; MYA= 0.446; 5-d; S or F; G/A/C/D; PHI= 0 d And NPC: MSA= 0.223; MYA= 0.446; 5-d; For application refer to Note 1; PHI= 0 d	2	FDC + NPC
	Chayote (fruit); Chinese waxgourd (Chinese preserving melon); citron melon; cucumber; gherkin; edible gourd (includes hyotan, cucuzza, hechima, Chinese okra); <i>Momordica</i> spp (includes balsam apple, balsam pear, bitter melon, Chinese cucumber); muskmelon (includes cantaloupe); pumpkin; squash (summer and winter, includes butternut squash, calabaza, hubbard squash, acorn squash, spaghetti squash); watermelon: FDC: MSA= 0.178; MYA= 0.446 (one soil Appl. + two foliar); 5-d; S or F; G/A/C/ D; PHI= 7 d	3	FDC
	All crops listed for product 3 above (CG 9): FDC: MSA= 0.222; MYA= 0.444; 10-d; S or F; G/A/C; PHI= 7 d	5	FDC
	All crops listed for product 3 above MSA= 0.125; MYA= 0.446 (0.448?); 7-d; S or F; G/A/C; PHI= 0 d (up to 0.446)	6	FDC + FDS

Note 1: Varies by crop: applied chemical is to reach the root zone by irrigating-in, drench, and chemigation or in seed-furrow

Table I-4 Fruiting vegetables, Ginseng Grapes and small vine fruits (refer to **Abbreviations**, above)

<i>CR or GC</i>	<i>Crops</i>	<i>Product</i>	<i>Purpose</i>
Fruiting Vegetables	African eggplant, Bush tomato, Cocona, Currant tomato, Eggplant, Garden huckleberry, Goji berry, Groundcherry, Martynia, Naranjilla, Okra, Pea eggplant, Pepino, Pepper (<i>Capsicum</i> spp., including Bell, Chili, Cooking, Pimento and Sweet), Roselle, Scarlet eggplant, Sunberry, Tomatillo, Tomato, Tree tomato, and cultivars, varieties, and/or hybrids of these FDC: MSA= 0.233; MYA= 0.446; 5-d; S or F; G/A/C/D; PHI= 0 d NPC: MSA= 0.233; MYA= 0.446; 5-d; For application refer to Note 1; PHI= 0 d	2	FDC + NPC
	Tomato MSA= 0.091; MYA= 0.444; 7-d; S or F; G/A/C; PHI= 1 d	4	FDC
	Okra MSA= 0.167; MYA= 0.444; 14-d; S or F; G/A/C; PHI= 3 d	5	FDC
	All crops listed for product 1 above (CG 8) MSA= 0.222; MYA= 0.444; 7-d; S or F; G/A/C; PHI= 7 d	5	FDC
	Eggplant, Groundcherry, Okra, Pepinos, Pepper (<i>Capsicum</i> spp., including bell, chili, cooking, pimento and sweet), Tomatillo, Tomato. MSA= 0.125; MYA= 0.446 (0.448?); 7-d; S or F; G/A/C; PHI= 3 d (up to 0.446)	6	FDC + FDS
Ginseng	Ginseng MSA= 0.223; MYA= 0.446; 5-d; S or F; G/A/C; PHI= 7 d	2	FDC
	Ginseng MSA= 0.220; MYA= 0.444; 7-d; S or F; G/A/C; PHI= 30 d	4	FDC
	Ginseng MSA= 0.125; MYA= 0.251; 7-d; S or F; G/A/C; PHI= 7	6	FDC
Grapes and small vine fruits (except fuzzy kiwifruit)	Amur river grape, Gooseberry, Grape, Kiwifruit, Hardy, Maypop, Schisandra berry, and cultivars, varieties, and/or hybrids of these FDC: MSA= 0.223; MYA= 0.446; 12-d; S or F; G/A/C/D; PHI= 7 d NPC: MSA= 0.223; MYA= 0.446; 12-d; For application refer to note 1; PHI= 7 d	2	FDC + FDS + NPC
	Non-bearing grapes: MSA= 0.221; MYA= 0.446; 12-d; F; AirBlast Drip	1	FDC
	Same crops listed for product 1 MSA= 0.220; MYA= 0.444; 12-d; S or F; G/A/C; PHI= 7 d	4	FDC
	Same crops listed for product 1 MSA= 0.112; MYA= 0.444; 12-d; S or F; G/A/C; PHI= 14 d	5	FDC + FDS
	Same crops listed for product 1 except (concord grapes) MSA= 0.125; MYA= 0.446 (0.448?); 7-d; S or F; G/A/C; PHI= 14 d (up to 0.446) up to 6 applications lowest single application= 0.066	6	FDC + FDS
	Non-bearing grapes: MSA= 0.125; MYA= Maximum 6 applications Assumed= 0.446 as it is not specified (minimum= 0.049); 12-d; F; AirBlast	7	FDC
	Non-bearing grapes: MSA= 0.125; MYA= 6 applications Assumed= 0.446 as it is not specified (minimum= 0.049); 12-d; F; AirBlast	9	FDC
	Non-bearing grapes: MSA= 0.224; MYA= 0.446; 12-d; F; AirBlast	10	FDC

Note 1: Varies by crop: applied chemical is to reach the root zone by irrigating-in, drench, and chemigation or in seed-furrow

Table I-5 Grasses, Herbs, and Hops, Leafy green/petiole vegetables (refer to **Abbreviations**, above)

<i>CR or GC</i>	<i>Crops</i>	<i>Product</i>	<i>Purpose</i>
Grasses for forage/feed (including grasses grown for seed)	Grass forage, fodder, or hay: Any grass (<i>Gramineae</i> family) except sugarcane that will be fed to or grazed by livestock, all pasture and range grasses and grasses grown for hay or silage MSA= 0.223; MYA= 0.446; 14-d; S or F; G/A/C; PHI= 7 d	2	FDC
	Same crops listed for product 1 MSA= 0.222; MYA= 0.444; 14-d; S or F; G/A/C; PHI= 7 d	5	FDC
	Same crops listed for product 1 MSA= 0.125; MYA= 0.251; 14-d; S or F; G/A/C; PHI= 7	6	FDC
Herbs and Spices (except black pepper)	Allspice, Angelica, Anise (anise seed), Anise (star), Annatto (seed), Balm (lemon balm), Basil (fresh and dried), Borage, Bumet, Camomile, Caper buds, Caraway, Caraway (black), Cardamom, Cassia (bark and buds), Catnip, Celery seed, Chervil (dried), Chinese chive, Chive, Cinnamon, Clary, Clove (buds), Coriander (cilantro or Chinese parsley leaves, Coriander seed (cilantro seed), Costmary, Culantro (leaf and seed), Cumin, Curry leaf, Dill (seed), Dillweed, Fennel [common and Florence (seed)], Fenugreek, Grains of paradise, Horehound, Hyssop, Juniper berry, Lavender, Lemongrass, Lovage (leaf and seed), Mace, Marigold, Marjoram, Mustard (seed), Nasturtium, Nutmeg, Parsley (dried), Pennyroyal, Poppy (seed), Rosemary, Rue, Saffron, Sage, Savory (summer and winter), Sweet bay (bay leaf), Tansy, Tarragon, Thyme, Vanilla, Wintergreen, Woodruff, Wormwood. MSA= 0.223; MYA= 0.446; 7-d; S or F; G/A/C/D; PHI= 0 d	2	FDC + FDS
	Same crops listed for product 1 MSA= 0.125; MYA= 0.251; 14-d; S or F; G/A/C; PHI= 7	6	FDC
Hops	Hops: MSA= 0.223; MYA= 0.446; 14-d; S or F; G/A/C/D; PHI= 7 d	2	FDC
	Hops: MSA= 0.222; MYA= 0.444; 14-d; S or F; G/A/C; PHI= 14 d	5	FDC + FDS
	Hops MSA= 0.125; MYA= 0.446 (0.448?); 14-d; S or F; G; PHI= 14 d (up to 0.446) up to 4 applications Min 0.049	6	FDC + FDS
Leafy Green Vegetables**	Amaranth (Leafy amaranth, Chinese spinach, Tampala), Arugula (Roquette), Cardoon, Celery, Celtuce, Chervil, Chinese celery, Chrysanthemum (Edible-leaved and Garland), Cilantro, Corn salad, Cress (Garden), Cress (Upland, Yellow rocket, Winter cress), Dandelion, Dock (Sorrel), Endive (Escarole), Florence fennel (Sweet anise, Sweet fennel, Finocchio), Lettuce (Head and Leaf), Orach, Parsley, Purslane (Garden and Winter), Radicchio (Red chicory), Rhubarb, Spinach [including New Zealand and vine (Malabar spinach, Indian spinach)], Swiss chard, Watercress MSA= 0.223; MYA= 0.446; 7-d; S or F; G/A/C/D; PHI= 0 d	2	FDC
	Same crops listed for product 1 MSA= 0.125; MYA= 0.251; 14-d; S or F; G/A/C; PHI= 7	6	FDC + FDS
Leafy Petiole Vegetables	Cardoon, Celery, Celtuce, Chinese celery, Florence fennel (including, sweet anise, sweet fennel, Finocchio), Rhubarb, Swiss chard MSA= 0.095; MYA= 0.251; 14-d; S or F; G/A/C/D; PHI= 7 d	6	FDC + FDS

Table I-6 Legumes and Ornamentals (refer to **Abbreviations**, above)

<i>CR or GC</i>	<i>Crops</i>	<i>Product</i>	<i>Purpose</i>
Legume Vegetables (including soybean)	Crops: Edible Podded and Succulent Shelled Pea and Bean and Dried Shelled Pea and Bean, Bean (<i>Lupinus</i> spp., includes Grain lupin, Sweet lupin, White lupin, and White sweet lupin), Bean (<i>Phaseolus</i> spp., includes Field bean, Kidney bean, Lima bean, Navy bean, Pinto bean, Runner bean, Snap bean, Tepary bean, Wax bean), Bean (<i>Vigna</i> spp., includes Adzuki bean, Asparagus bean, Blackeyed pea, Catjang, Chinese longbean, Cowpea, Crowder pea, Moth bean, Mung bean, Rice bean, Southern pea, Urd bean, Yardlong bean), Pea (<i>Pisum</i> spp., includes Dwarf pea, Edible pea, Edible-pod pea, English pea, Field pea, Garden pea, Green pea, Snow pea, Sugar snap pea), Other Beans and Peas [Broad bean (Fava), Chickpea (Garbanzo bean), Guar, Jackbean, Lablab bean (Hyacinth bean), Lentil, Pigeon pea, Soybean, Soybean (immature seed), Sword bean Plus: plant parts of any legume that will be used as animal feed FDC: MSA= 0.2230; MYA= 0.446; 7-d; S or F; G/A/C; PHI= 0 d NPC: MSA= 0.223; one application; For application refer to Note 1; PHI= 0 d	2	FDC + NPC
	Soybean crop only MSA= 0.134; MYA= 0.403; 10-d; S or F; G/A/C; PHI= 21 d	3	FDC
	Soybean crop only MSA= 0.112; MYA= 0.337; 10-d; S or F; G/A/C; PHI= 21 d	5	FDC + FDS
	Soybean crop only MSA= 0.125; MYA= 0.251; 10-d; S or F; G/A/C; PHI= 21 d	6	FDC + FDS
Ornamentals	Ornamentals (foliar or flower Diseases) in residential and commercial landscapes, interiorscapes, field grown and container ornamentals in nurseries and greenhouses, lath houses, shade houses, containers and other enclosed structures. Restricted for application to non-bearing fruit trees G (foliar)	1	FDC
	Ornamentals (for all listed ornamentals) MSA= 0.221; MYA= 0.446; 5-d; F or Drench; G/C		
	Ornamental sunflower: MSA= 0.221; MYA= 0.446; 14-d; F; G/C		
	Spot Treatment: Same as Turf (will be low rate compared to total treatment)		
	Ornamentals (foliar or stem, root and Damping off of New Seedlings Diseases) in ornamentals listed above for product 2 MSA= 0.130; MYA= 0.445 for plants grown in outdoor nurseries, outdoor seedbeds, field plantings, and landscapes and 0.130 for foliar application; 7-d; F or Drench; G	7	FDC
	Ornamentals (foliar or stem, root and Damping off of New Seedlings Diseases) in ornamentals listed above for product 2 MSA= 0.131; MYA= 0.445 for plants grown in outdoor nurseries, outdoor seedbeds, field plantings, and landscapes and 0.131 for foliar application; 7-d; F or Drench; G	9	FDC
	Ornamental sunflower: MSA= 0.224; MYA= 0.446; 7-d; F; G	10	FDC
	Ornamentals: MSA= 0.223 (30-d) Or one application 0.446; Apply by soil Drench	10	NPC
	Spot Treatment Same as Turf (will be low rate compared to total treatment)	10	FDC + NPC
	Ornamentals: MSA= 0.223 (30-d) Or one application 0.446; Apply by soil Drench	11	NPC
	Spot Treatment Same as Turf (will be low rate compared to total treatment)	11	NPC

Note 1: Varies by crop: applied chemical is to reach the root zone by irrigating-in, drench, and chemigation or in seed-furrow

Table I-7 Peanuts, Pome Fruits, and Potato and Other Tuberous, and Corm Vegetables (refer to Abbreviations, above)

CR or GC	Crops	Product	Purpose
Peanuts	Peanuts crop FDC: MSA= 0.223; MYA= 0.446; 14-d; S or F; G/A/C; PHI= 7 d NPC: MSA= 0.223; one application; For application refer to Note 1	2	FDC + NPC
	Peanuts Seed Treatment One application at 0.284 lb a.i/A	2	FDC + NPC
	Peanut crop MSA= 0.178; MYA= 0.446; 14-d; S or F; G/A/C; PHI= 14 d (up to 0.446 w/other)	3	FDC
	Peanut crop MSA= 0.205; MYA= 0.444; 14-d; S or F; G/A/C; PHI= 14 d	5	FDC + FDS
	Peanut crop MSA= 0.115; MYA= 0.446 (0.448); 14-d; S or F; G/A/C; PHI= 14 d	6	FDC + FDS
Pome Fruits	Apple, Azarole, Crabapple, Loquat, Mayhaw, Medlar, Pear, Pear (Asian), Quince, Quince (Chinese and Japanese), Tejocote, and cultivars, varieties, and/or hybrids of these MSA= 0.223; MYA= 0.446; 7-d; S or F; G/A/C/D; PHI= 7 d	2	FDC + FDS
	None bearing: MSA= 0.221; MYA= 0.446; 7-d; F; AirBlast Drip	1	FDC
	CG 11: Apple, Crabapple, Loquat, Mayhaw, Pear, Oriental pear, Quince MSA= 0.130; MYA= 0.444; 7-d; S or F; G/AB/C; PHI= 72 d	4	FDC
	CG 11: Apple, Crabapple, Loquat, Mayhaw, Pear, Oriental pear, Quince MSA= 0.131; MYA= 0.444; 10-d; S or F; G/AB/C; PHI= 75 d	5	FDC + FDS
	Crops listed for product 4: MSA= 0.095; MYA= 0.345; 7-d; S or F; G/A/C/D; PHI= 14 d; not more than 4 applications Min application= 0.082	6	FDC
	None bearing: MSA= 0.095; MYA= 0.345; 7-d; F; AirBlast	7	FDC
	None bearing: MSA= 0.095; MYA= 0.345; 7-d; F; AirBlast	9	FDC
	Non-bearing trees: MSA= 0.224; MYA= 0.446; 7-d; F; AirBlast	10	FDC
Potato and Other Tuberous, and Corm Vegetables	Arracacha, Arrowroot, Artichoke (Chinese and Jerusalem), Canna (Edible), Cassava (Bitter & Sweet), Chayote (root), Chufa, Dasheen, Ginger, Leren, Potato, Sweet potato, Tanier (Cocoyam), Turmeric, Yam bean (Jicama, Manioc pea), Yam (True) FDC: MSA= 0.223; MYA= 0.446; 5-d; S or F; G/A/C; PHI= 7 d NPC: MSA= 0.223; one application; For application refer to Note 1	2	FDC + FDS + NPC
	Same crops above MSA= 0.091; MYA= 0.444; 7-d; S or F; G/A/C; PHI= 7 d	4	FDC
	Arracacha, Arrowroot, Artichoke (Chinese and Jerusalem), Beet (garden), Burdock (edible), Canna (edible, Queensland arrowroot), Cassava (bitter & sweet), Celeriac (celery root), Chayote (root), Chervil (turnip-rooted), Chicory, Chufa, Dasheen (taro), Ginger, Horseradish, Leren, Parsley (turnip-rooted), Parsnip, Potato, Radish, Oriental radish (daikon), Rutabaga, Salsify (black), Salsify (oyster plant), Salsify (Spanish), Skirret, Sweet potato, Tanier (cocoyam), Turmeric, Turnip, Yam bean (jicama, Manioc pea), Yam (true). (<i>See separate use directions for Artichoke (globe), Carrot, Ginseng, and Sugarbeet</i>) MSA= 0.095; MYA= 0.377; 14-d; S or F; G/A/C; PHI= 7 d; No more than 4 applications noting that the minimum rate= 0.082	6	FDC + FDS

Note 1: Varies by crop: applied chemical is to reach the root zone by irrigating-in, drench, and chemigation or in seed-furrow

Table I-8 Small berries and Stone fruits (refer to **Abbreviations**, above)

<i>CR or GC</i>	<i>Crops</i>	<i>Product</i>	<i>Purpose</i>
Small Berries	Blackberry <i>Rubus</i> spp., (including Andean Blackberry, Artic blackberry, Bingleberry, Black satin berry, Boysenberry, Brombeere, California blackberry, Chesterberry, Cherokee blackberry, Cheyenne blackberry, Common blackberry, Coryberry, Darrowberry, Dewberry, Dirksen thornless berry, Evergreen blackberry, Himalayaberry, Hullberry, Lavacaberry, Loganberry, Lowberry, Lucretiaberry, Mammoth blackberry, Marionberry, Mora, Mures deronce, Nectarberry, Northern dewberry, Olallieberry, Oregon evergreen berry, Phenomenalberry, Rangeberry, Ravenberry, Rossberry, Shawnee blackberry, Southern dewberry, Tayberry, Youngberry, Zarzamora, and cultivars, varities, and/or hybrids of these. Raspberry <i>Rubus</i> spp. (<i>Rubus occidentalis</i> , <i>Rubus strigosus</i> , <i>Rubus idaeus</i>) (including Bababerry, Black raspberry, Blackcap, Framboise, Frambueso, Himbeere, Keriberry, Mayberry, Purple raspberry, Red raspberry, Thimbleberry, Tulameen, Wild raspberries, Yellow raspberry) and cultivars, varieties, and/or hybrids of these. MSA= 0.223; MYA= 0.453; 7-d; S or F; G/A/C/D; PHI= 0 d	2	FDC + FDS
	Bushberry (Aronia), Blueberry (Highbush and lowbush), Currant (Buffalo), Guava (Chilean), Currant (Black and Red), Barberry (European), Elderberry, Gooseberry, Cranberry (highbush), Honeysuckle, Huckleberry, Jostaberry, Juneberry, Currant (Native), Salal, Sea buckthorn and cultivars, varieties, and/or hybrids of these MSA= 0.178; MYA= 0.356; 7-d; F; G/C; PHI= 7 d (up to 0.446 w/other)	3	FDC
	Blackberry, Raspberry and Bushberry 0.220-0.445/7-d G/A/AB/C MSA= 0.220 ; MYA= 0.444; 7-d; S or F; G/A/C; PHI= 0 d	4	FDC
	Apricot, Apricot (Japanese), Capulin, Cherry (Black, Nanking, Sweet, Tart), Jujube (Chinese), Nectarine, Peach, Plum, Plum (American, Beach, Canada, Cherry, Chickasaw, Damson, Japanese, Klamath), Prune, Plumcot, Sloe, and cultivars, varieties, and/or hybrids of these MSA= 0.223; MYA= 0.445; 5-d; S or F; G/A/C/D; PHI= 0 d	2	FDC
	None bearing drip or sprat early bloom depending on the disease MSA= 0.221; MYA= 0.446; 5-d; F; AirBlast Drip	1	FDC
	Apricot, Nectarine, Peach, Plum (all varieties including Chickasaw, Damson, Japanese, and Stanley), Plumcot, Prune (fresh and dried) MSA= 0.220; MYA= 0.444; 7-d; S or F; G/AB/C; PHI= 30 d	4	FDC + FDS
	Crop Group 12: Apricot, Cherry (sweet and tart), Nectarine, Peach, Plum (all varieties including Chickasaw, Damson, Japanese, and Stanley), Plumcot, Prune (fresh and dried). MSA= 0.131; MYA= 0.444; 7-d; S or F; G/AB/C; PHI= 0 d	5	FDC
	Apricot, Cherry (sweet and tart), Nectarine, Peach, Plum (including Chickasaw, Damson and Japanese), Plumcot, Prune (fresh and dried). MSA= 0.125; MYA= 0.446 (0.448?); 7-d; S or F; G/A/C; PHI= 1 d No more than 4 application Min application rate= 0.082	6	FDC
	None bearing MSA= 0.125; MYA= 0.251 not more than 4 applications (minimum application 0.082); 7-d; F; AirBlast	7	FDC
	None bearing MSA= 0.125; MYA= 0.251; 7-d; F; AirBlast	9	FDC
Stone Fruits	Non-bearing trees MSA= 0.224; MYA= 0.446; 5-d; F; AirBlast	10	FDC

Table I-9 Strawberry, Sugar beet, and Sunflower (refer to **Abbreviations**, above)

<i>CR or GC</i>	<i>Crops</i>	<i>Product</i>	<i>Purpose</i>
Strawberry and Other Low-growing Berries	Bearberry, Bilberry, Blueberry (Low-bush), Cloudberry, Cranberry, Lingonberry, Muntries, Partridgeberry, Strawberry FDC: MSA= 0.223; MYA= 0.446; 7-d; 7-d; S or F; G/A/C/D; PHI= 0 d NPC: MSA= 0.223; MYA= 0.446; 7-d; For application refer to Note 1; PHI= 0 d	2	FDC +NPC
	All of the above except strawberry MSA= 0.135; MYA= 0.313; 7-d; F; G/C; PHI= 45 d (up to 0.446 w/other)	3	FDC
	Bearberry, Bilberry, Blueberry (Low-bush), Cloudberry, Cranberry, Ligonberry, Muntries, Partridgeberry, Strawberry MSA= 0.220; MYA= 0.444; 7-d; S or F; G/A/C; PHI= 1 d	4	FDC + FDS
	Crops the same as listed for product 4, above MSA= 0.125; MYA= 0.446 (27.3=0.448? should be 27.2=0.446); 7-d; S or F; G/A/C; PHI= 0 d Min application rate= 0.067	6	FDC + FDS
Sugar beet	Sugar beet MSA= 0.223; MYA= 0.453; 5-d; F; G/A/C; PHI= 7 d	2	FDC
	Sugar beet MSA= 0.178; MYA= 0.446; 14-d; S or F; G/A/C; PHI= 7 d	3	FDC
	Sugar beet MSA= 0.125; MYA= 0.330; 10-d; S or F; G/A/C; PHI= 21 d	6	FDC
Sunflower Subgroup	Calendula, castor oil plant, Chinese tallowtree, euphorbia, evening primrose, jojoba, niger seed, rose hip, safflower, stokes aster, sunflower, tallowwood, tea oil plant, vernonia, cultivars, varieties, and/or hybrids of these MSA= 0.223; MYA= 0.446; 14-d; S or F; G/A/C; PHI= 14 d	2	FDC
	Sunflower: MSA= 0.167; MYA= 0.444; 14-d; S or F; G/A/C; PHI= 50 d	5	FDC

Note 1: Varies by crop: applied chemical is to reach the root zone by irrigating-in, drench, and chemigation or in seed-furrow

Table I-10 Tree nuts (refer to **Abbreviations**, above)

<i>CR or GC</i>	<i>Crops</i>	<i>Product</i>	<i>Purpose</i>
Tree Nuts	African nut-tree, Almond, Beechnut, Brazil nut, Brazilian pine, Bunya, Bur oak, Butternut, Cajou nut, Candlenut, Cashew, Chestnut, Chinquapin, Coconut, Coquito nut, Dika nut, Ginkgo, Guiana chestnut, Hazelnut (Filbert), Heartnut, Hickory nut, Japanese horse-chestnut, Macadamia nut (bush nut), Mongongo nut, Monkey-pot, Monkey puzzle nut, Okari nut, Pachira nut, Peach palm nut, Pecan, Pequi, Pili nut, Pine nut, Pistachio, Sapucaia nut, Tropical almond, Walnut [including Black and English (Persian) walnuts], Yellowhorn, and cultivars, varieties, and/or hybrids of these MSA= 0.223; MYA= 0.446; 7-d; S or F; G/A/C/D; PHI= 7 d	2	FDC
	Almonds MSA= 0.220; MYA= 0.444; 7-d; S or F; G/A/AB/C; PHI= 30 d	4	FDC + FDS
	Pistachio MSA= 0.220; MYA= 0.444; 7-d; S or F; G/A/AB/C; PHI= 30 d	4	FDC
	Crop Group 14 (<i>See separate use directions for: Almonds, Pecan, and Pistachio</i>): Beech nut, Brazil nut, Butternut, Cashew, Chestnut, Chinquapin, Filbert (hazelnut), Hickory nut, Macadamia nut (bush nut), Walnut [including black and English (Persian) walnuts] MSA= 0.222; MYA= 0.444; 7-d; S or F; G/A/AB/C; PHI= 35 d	5	FDC + FDS
	Pecans MSA= 0.220; MYA= 0.444; 14-d; S or F; G/A/AB/C; PHI= shucks begin to split	5	FDC
	Pistachio MSA= 0.220; MYA= 0.444; 10-d; S or F; G/A/AB/C; PHI= 35 d	5	FDC
	Almonds MSA= 0.220; MYA= 0.444; 7-d; S or F; G/A/AB/C; PHI= 35 d	5	FDC + FDS
	Almonds MSA= 0.125; MYA= 0.446 (0.448?); 7-d; S or F; G/A/AB/C; PHI= 14 d	6	FDC
	Pecans MSA= 0.125; MYA= 0.446 (0.448?); 14-d; S or F; G/A/AB/C; PHI= 30 Maximum 6 applications Min application= 0.067	6	FDC
	Pistachio MSA= 0.125; MYA= 0.377; 14-d; S or F; G/A/AB/C; PHI= 28 d	6	FDC
	(<i>See separate use directions for: Almonds, Pecan, and Pistachio</i>): Beech nut, Brazil nut, Butternut, Cashew, Chestnut, Chinquapin, Filbert (hazelnut), Hickory nut, Macadamia nut (bush nut), Walnut [including black and English (Persian) walnuts]. MSA= 0.125; MYA= 0.446 (0.448?); 7-d; S or F; G/A/AB/C; PHI= 60 d	6	FDC
	Non-bearing tree nuts MSA= 0.125; MYA= 0.251 not more than 4 applications (minimum application= 0.082; 7-d; F; AirBlast	7	FDC
	Non-bearing tree nuts MSA= 0.125; MYA= 0.251 not more than 4 applications (minimum application= 0.082; 7-d; F; AirBlast	9	FDC

Table I-11 Turf (refer to **Abbreviations**, above)

CR or GC	Crops	Product	Purpose
Turf	Areas: Turf on golf courses, sod farms, sport fields, residential, institutional, municipal, commercial, and other turf grass areas Grass types: <ul style="list-style-type: none"> All cool season turf grasses such as Bent grasses, Bluegrasses, Fescues, Ryegrasses, including mixtures thereof; All warm season grasses such as Bermudagrass, St Augustine grass, Seashore paspalum, Kikuyu grass, and Zoysia grass FDC: MSA= 0.226; MYA= 0.446; 7-14-d (for low/high rates); F; G/C NPC: MSA= 0.226; MYA= 0.446; 14-d; Or one application at 0.453; For application refer to note 2	1	FDC + NPC
	Spot treatment: Use maximum rates FDC: MSA= 5.20 E⁻⁶/sq ft (5.20 E⁻²/Acre) Four Appl./= MYA= 0.208; 14-d; F; G/C NPC: MSA= 1.04 E⁻⁵/sq ft (Four Appl./= MYA= 0.416; 14-d; For application refer to Note 2	1	
	Turf as specified for product 2, above FDC: MSA= 0.212- 0.446; MYA= 0.446; 7-14 d (for low/high rates); F; G NPC: MSA= 0.212; MYA= 0.446; 14 d; Or one application at 0.446; For application refer to Note 2	7	FDC + NPC
	Turf as specified for product 2, above FDC: MSA= 0.212- 0.446; MYA= 0.446; 7-14 d (for low/high rates); F; G NPC: MSA= 0.212; MYA= 0.446; 14 d; Or one application at 0.446; For application refer to Note 2	8	FDC + NPS
	Spot treatment: 4 times the highest rate for 10,00 sq. ft instead of 1,000 sq ft	8	FDC + NPC
	Turf as specified for product 2, above FDC: MSA= 0.214- 0.429; MYA= 0.445; 7-10-14 d (for low/high rates); F; G NPC: MSA= 0.214-0.429; MYA= 0.445; 14- d; For application refer to Note 2	9	FDC + NPC
	Turf as specified for product 2, above FDC: MSA= 0.057- 0.227; MYA= 0.446; 7-14 d (for low/high rates); F; G/Drench NPC: MSA= 0.227-0.455; MYA= 0.446; 14- d; For application refer to Note 2	10	FDC + NPC
	Spot treatment: 4 times the highest rate for 10,00 sq. ft instead of 1,000 sq ft	10	FDC + NPC
	Turf as specified for product 2, above MSA= 0.227-0.455; MYA= 0.446; 14- d; Appli. For application refer to Note 2	11	NPC
	Spot treatment: 4 times the highest rate for 10,00 sq. ft instead of 1,000 sq ft	11	NPC

Note 2: Irrigate-in to the root zone

Appendix 2:

			Freshwater Fish	Freshwater Invertebrates	Freshwater Fish	Freshwater Invertebra
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Crop Group/Crops	Scenario Giving the Highest EECs	Peak EEC (µg/L)	Acute EC/LC50 (µg a.i./L)	Acute EC/LC50 (µg a.i./L)	Acute RQ	Acute RQ
Artichoke	Artichoke	21.6	>1780	>17000	<0.01	<0.01
Beans & Peas	ILbeansNMC_+65	47.8	>1780	>17000	<0.03	<0.01
Brassica Leafy Vegetables	CAColeCropRLF_V2_+65	37.3	>1780	>17000	<0.02	<0.01
Bulb Vegetables	GAOnion_WirrigSTD_+210	23.6	>1780	>17000	<0.01	<0.01
Canola	NDcanolaSTD_+95	31.5	>1780	>17000	<0.02	<0.01
Carrot	FLcarrotSTD_+0	40.2	>1780	>17000	<0.02	<0.01
Cereals: Corn and Sorghum	MScornSTD_+135 & KSCornStd_+160	50.1	>1780	>17000	<0.03	<0.01
Cereals: Wheat & others	TXwheatOP_+235	51.3	>1780	>17000	<0.03	<0.01
Christmas Trees	Christmas Trees	6.94	>1780	>17000	<0.01	<0.01
Citrus	FLcitrusSTD_+145	20.6	>1780	>17000	<0.01	<0.01
Cotton	STXcottonNMC_+160 & NCcottonSTD_+75	31.7	>1780	>17000	<0.02	<0.01
Cucurbits	STXmelonNMC_+9 & FLCucumberSTD_+0	39.2	>1780	>17000	<0.02	<0.01
Fruiting Vegetables	STXvegetableNMC_+170 & FLpeppersSTD_+10	40.7	>1780	>17000	<0.02	<0.01
Ginseng	MNsugarbeetSTD_+10	34.1	>1780	>17000	<0.02	<0.01
Grapes & Small Vine Fruits	NYGrapesSTD_+90	19.6	>1780	>17000	<0.01	<0.01
Grasses for Forage/Seeds	ORgrasseedSTD_+160	21.4	>1780	>17000	<0.01	<0.01
Herbs & Spices	CAColeCropRLF_V2_+60	36.7	>1780	>17000	<0.02	<0.01
Hops	ORhopsSTD_+140	24	>1780	>17000	<0.01	<0.01
Leafy Vegetables + Petiole	CAlettuceSTD_+95	40.3	>1780	>17000	<0.02	<0.01
Legume Vegetables W/Soybeans	MSsoybeanSTD_+165	37.6	>1780	>17000	<0.02	<0.01
Ornamentals: Residential	CApervious/imperviousRLF	4.57	>1780	>17000	<0.01	<0.01

Ornamentals: Nurseries	MI_nurserySTD_V2_+230	29.6	>1780	>17000	<0.02	<0.01
Peanut	NCpeanutSTD_+140	32.4	>1780	>17000	<0.02	<0.01
Pome Fruits	NCappleSTD_+35	19.3	>1780	>17000	<0.01	<0.01
Potato, Tuberous/Corm Vegies	MEpotatoSTD_+120	50.2	>1780	>17000	<0.03	<0.01
Small Berries	CAWineGrapesRLF_V2_+150	13.3	>1780	>17000	<0.01	<0.01
Stone Fruits	MIcherriesSTD_+80	20.2	>1780	>17000	<0.01	<0.01
Strawberry	CAStrawberrynonplasticRLF_V2_+5	40.7	>1780	>17000	<0.02	<0.01
Sugar beet	MNsugarbeetSTD_+10	34.1	>1780	>17000	<0.02	<0.01
Sunflower	CacornOP_+140	18.1	>1780	>17000	<0.01	<0.01
Tree nuts	GAPecansSTD_+75	21.2	>1780	>17000	<0.01	<0.01
Turf	PAturfSTD_+60	16.5	>1780	>17000	<0.01	<0.01

Chronic FW RQs		Surface Water (EECs ug/L)		Freshwater Fish	Freshwat er Invertebr ates	Freshwat er Fish	Fresh Inverte
Crop Group/Crops	Scenario Giving the Highest EECs	21-day	60- day	Chronic	Chronic	Chronic	Chronic
Artichoke	Artichoke	21.3	21.0	135	1240	0.16	0.01
Beans & Peas	ILbeansNMC_+65	47.0	46.2	135	1240	0.34	0.01
Brassica Leafy Vegetables	CAColeCropRLF_V2_+65	36.7	36.0	135	1240	0.27	0.01
Bulb Vegetables	GAOnion_WirrigSTD_+210	23.2	22.9	135	1240	0.17	0.01
Canola	NDcanolaSTD_+95	31.1	30.9	135	1240	0.23	0.01
Carrot	FLcarrotSTD_+0	38.3	36.4	135	1240	0.27	0.01
Cereals: Corn and Sorghum	MScornSTD_+135 & KSCornStd_+160	49.3	48.2	135	1240	0.36	0.01
Cereals: Wheat & others	TXwheatOP_+235	49.9	48.9	135	1240	0.36	0.01
Christmas Trees	Christmas Trees	6.8	6.7	135	1240	0.05	0.01
Citrus	FLcitrusSTD_+145	20.2	19.4	135	1240	0.14	0.01
Cotton	STXcottonNMC_+160 & NCcottonSTD_+75	30.7	30.5	135	1240	0.23	0.01

Cucurbits	STXmelonNMC_+9 & FLcucumberSTD_ +0	38.2	36.2	135	1240	0.27	0.
Fruiting Vegetables	STXvegetableNMC _+170 & FLpeppersSTD_+1 0	39.6	38.6	135	1240	0.29	0.
Ginseng	MNsugarbeetSTD_ +10	33.7	33.3	135	1240	0.25	0.
Grapes & Small Vine Fruits	NYGrapesSTD_+9 0	19.4	19.2	135	1240	0.14	0.
Grasses for Forage/Seeds	ORgrasseedSTD_ +160	21.0	20.6	135	1240	0.15	0.
Herbs & Spices	CAColeCropRLF_ V2_+60	36.2	35.6	135	1240	0.26	0.
Hops	ORhopsSTD_+140	23.7	23.5	135	1240	0.17	0.
Leafy Vegetables + Petiole	CAlettuceSTD_+95	39.8	39.2	135	1240	0.29	0.
Legume Vegetables W/Soybeans	MSsoybeanSTD_+ 165	37.2	37.1	135	1240	0.27	0.
Ornamentals: Residential	CApervious/imperv iousRLF	4.5	4.4	135	1240	0.03	0.
Ornamentals: Nurseries	MINurserySTD_V2 _+230	29.3	29.4	135	1240	0.22	0.
Peanut	NCpeanutSTD_+14 0	32.0	31.6	135	1240	0.23	0.
Pome Fruits	NCappleSTD_+35	18.4	17.2	135	1240	0.13	0.
Potato, Tuberous/Corm Vegies	MEpotatoSTD_+12 0	49.9	49.6	135	1240	0.37	0.
Small Berries	CAWineGrapesRL F_V2_+150	13.4	13.1	135	1240	0.10	0.
Stone Fruits	MICherriesSTD_+ 80	20.0	19.7	135	1240	0.15	0.
Strawberry	CAStrawberrynonp lasticRLF_V2_+5	40.0	39.1	135	1240	0.29	0.
Sugar beet	MNsugarbeetSTD_ +10	33.7	33.3	135	1240	0.25	0.
Sunflower	CACornOP_+140	17.8	17.6	135	1240	0.13	0.
Tree nuts	GAPecansSTD_+7 5	21.2	21.3	135	1240	0.16	0.
Turf	PATurfSTD_+60	16.2	15.8	135	1240	0.12	0.

Crop Group/Crops	Scenario Giving the Highest EECs	Peak EEC (ug a.i./L)	Saltwater Invertebrates EC/LC50 (ug a.i./L)	Saltwater Invertebrates Acute RQs*
Artichoke	Artichoke	21.6	510	0.04
Beans & Peas	ILbeansNMC_+65	47.8	510	0.09
Brassica Leafy Vegetables	CAColeCropRLF_V2_+65	37.3	510	0.07
Bulb Vegetables	GAOnion_WirrigSTD_+210	23.6	510	0.05
Canola	NDcanolaSTD_+95	31.5	510	0.06
Carrot	FLcarrotSTD_+0	40.2	510	0.08
Cereals: Corn and Sorghum	MScornSTD_+135 & KSCornStd_+160	50.1	510	0.10
Cereals: Wheat & others	TXwheatOP_+235	51.3	510	0.10
Christmas Trees	Christmas Trees	6.9	510	0.01
Citrus	FLcitrusSTD_+145	20.6	510	0.04
Cotton	STXcottonNMC_+160 & NCcottonSTD_+75	31.7	510	0.06
Cucurbits	STXmelonNMC_+9 & FLCucumberSTD_+0	39.2	510	0.08
Fruiting Vegetables	STXvegetableNMC_+170 & FLpeppersSTD_+10	40.7	510	0.08
Ginseng	MNsugarbeetSTD_+10	34.1	510	0.07
Grapes & Small Vine Fruits	NYGrapesSTD_+90	19.6	510	0.04
Grasses for Forage/Seeds	ORgrasseedSTD_+160	21.4	510	0.04
Herbs & Spices	CAColeCropRLF_V2_+60	36.7	510	0.07
Hops	ORhopsSTD_+140	24.0	510	0.05
Leafy Vegetables + Petiole	CAlettuceSTD_+95	40.3	510	0.08
Legume Vegetables W/Soybeans	MSsoybeanSTD_+165	37.6	510	0.07
Ornamentals: Residential	CApervious/imperviousRLF	4.6	510	0.01
Ornamentals: Nurseries	MInurserySTD_V2_+230	29.6	510	0.06
Peanut	NCpeanutSTD_+140	32.4	510	0.06
Pome Fruits	NCappleSTD_+35	19.3	510	0.04
Potato, Tuberous/Corm Vegies	MEpotatoSTD_+120	50.2	510	0.10
Small Berries	CAWineGrapesRLF_V2_+150	13.3	510	0.03
Stone Fruits	MICherriesSTD_+80	20.2	510	0.04
Strawberry	CAStrawberrynonplasticRLF_V2_+5	40.7	510	0.08
Sugar beet	MNsugarbeetSTD_+10	34.1	510	0.07
Sunflower	CACornOP_+140	18.1	510	0.04
Tree nuts	GApecansSTD_+75	21.2	510	0.04
Turf	PATurfSTD_+60	16.5	510	0.03
*All RQs are less than the value presented since the toxicity endpoint is greater than 510 ug a.i./L				
			Endpoints	

Crop Group/Crops	Scenario Giving the Highest EECs	Peak EEC (ug a.i./L)	Nonvascular Aquatic Plant	Nonvascular Aquatic Plant	Nonvascular Aquatic Plant
			Acute	Chronic	nonlist
Artichoke	Artichoke	21.6	3400	1170	0.01
Beans & Peas	ILbeansNMC_+65	47.8	3400	1170	0.01
Brassica Leafy Vegetables	CAColeCropRLF_V2_+65	37.3	3400	1170	0.01
Bulb Vegetables	GAOnion_WirrigSTD_+210	23.6	3400	1170	0.01
Canola	NDcanolaSTD_+95	31.5	3400	1170	0.01
Carrot	FLcarrotSTD_+0	40.2	3400	1170	0.01
Cereals: Corn and Sorghum	<i>MScornSTD_+135 & KSCornStd_+160</i>	<i>50.1</i>	3400	1170	0.01
Cereals: Wheat & others	TXwheatOP_+235	51.3	3400	1170	0.02
Christmas Trees	Christmas Trees	6.9	3400	1170	0.00
Citrus	FLcitrusSTD_+145	20.6	3400	1170	0.01
Cotton	<i>STXcottonNMC_+160 & NCcottonSTD_+75</i>	<i>31.7</i>	3400	1170	0.01
Cucurbits	<i>STXmelonNMC_+9 & FLCucumberSTD_+0</i>	<i>39.2</i>	3400	1170	0.01
Fruiting Vegetables	<i>STXvegetableNMC_+170 & FLpeppersSTD_+10</i>	<i>40.7</i>	3400	1170	0.01
Ginseng	MNsugarbeetSTD_+10	34.1	3400	1170	0.01
Grapes & Small Vine Fruits	NYGrapesSTD_+90	19.6	3400	1170	0.01
Grasses for Forage/Seeds	ORgrasseedSTD_+160	21.4	3400	1170	0.01
Herbs & Spices	CAColeCropRLF_V2_+60	36.7	3400	1170	0.01
Hops	ORhopsSTD_+140	24.0	3400	1170	0.01
Leafy Vegetables + Petiole	CAlettuceSTD_+95	40.3	3400	1170	0.01
Legume Vegetables W/Soybeans	MSsoybeanSTD_+165	37.6	3400	1170	0.01
Ornamentals: Residential	CApervious/imperviousRLF	4.6	3400	1170	0.00
Ornamentals: Nurseries	MINurserySTD_V2_+230	29.6	3400	1170	0.01
Peanut	NCpeanutSTD_+140	32.4	3400	1170	0.01
Pome Fruits	NCappleSTD_+35	19.3	3400	1170	0.01
Potato, Tuberous/Corm Vegies	MEpotatoSTD_+120	50.2	3400	1170	0.01
Small Berries	CAWineGrapesRLF_V2_+150	13.3	3400	1170	0.00
Stone Fruits	MICherriesSTD_+80	20.2	3400	1170	0.01
Strawberry	CAStrawberrynonplasticRLF_V2_+5	40.7	3400	1170	0.01
Sugar beet	MNsugarbeetSTD_+10	34.1	3400	1170	0.01
Sunflower	CACornOP_+140	18.1	3400	1170	0.01
Tree nuts	GA PecansSTD_+75	21.2	3400	1170	0.01
Turf	PATurfSTD_+60	16.5	3400	1170	0.00
			Endpoints		RQs

Crop Group/Crops	Scenario Giving the Highest EECs	Peak EEC (ug a.i./L)	Vascular Aquatic Plant	Vascular Aquatic Plant	Vascular Aquatic Plant	Vascular Aquatic Plant
			Acute	Chronic	nonlisted	listed
Artichoke	Artichoke	21.6	2600	278	0.01	0.08
Beans & Peas	ILbeansNMC_+65	47.8	2600	278	0.02	0.17
Brassica Leafy Vegetables	CAColeCropRLF_V2_+65	37.3	2600	278	0.01	0.13
Bulb Vegetables	GAOnion_WirrigSTD_+210	23.6	2600	278	0.01	0.08
Canola	NDcanolaSTD_+95	31.5	2600	278	0.01	0.11
Carrot	FLcarrotSTD_+0	40.2	2600	278	0.02	0.14
Cereals: Corn and Sorghum	MScornSTD_+135 & KSCornStd_+160	50.1	2600	278	0.02	0.18
Cereals: Wheat & others	TXwheatOP_+235	51.3	2600	278	0.02	0.18
Christmas Trees	Christmas Trees	6.9	2600	278	0.00	0.02
Citrus	FLcitrusSTD_+145	20.6	2600	278	0.01	0.07
Cotton	STXcottonNMC_+160 & NCcottonSTD_+75	31.7	2600	278	0.01	0.11
Cucurbits	STXmelonNMC_+9 & FLCucumberSTD_+0	39.2	2600	278	0.02	0.14
Fruiting Vegetables	STXvegetableNMC_+170 & FLpeppersSTD_+10	40.7	2600	278	0.02	0.15
Ginseng	MNsugarbeetSTD_+10	34.1	2600	278	0.01	0.12
Grapes & Small Vine Fruits	NYGrapesSTD_+90	19.6	2600	278	0.01	0.07
Grasses for Forage/Seeds	ORgrasseedSTD_+160	21.4	2600	278	0.01	0.08
Herbs & Spices	CAColeCropRLF_V2_+60	36.7	2600	278	0.01	0.13
Hops	ORhopsSTD_+140	24.0	2600	278	0.01	0.09
Leafy Vegetables + Petiole	CAlettuceSTD_+95	40.3	2600	278	0.02	0.14
Legume Vegetables W/Soybeans	MSsoybeanSTD_+165	37.6	2600	278	0.01	0.14
Ornamentals: Residential	CAPervious/imperviousRLF	4.6	2600	278	0.00	0.02
Ornamentals: Nurseries	MINurserySTD_V2_+230	29.6	2600	278	0.01	0.11
Peanut	NCpeanutSTD_+140	32.4	2600	278	0.01	0.12
Pome Fruits	NCappleSTD_+35	19.3	2600	278	0.01	0.07
Potato, Tuberous/Corm Vegies	MEpotatoSTD_+120	50.2	2600	278	0.02	0.18
Small Berries	CAWineGrapesRLF_V2_+150	13.3	2600	278	0.01	0.05
Stone Fruits	MICherriesSTD_+80	20.2	2600	278	0.01	0.07
Strawberry	CAStrawberrynonplasticRLF_V2_+5	40.7	2600	278	0.02	0.15
Sugar beet	MNsugarbeetSTD_+10	34.1	2600	278	0.01	0.12
Sunflower	CACornOP_+140	18.1	2600	278	0.01	0.07
Tree nuts	GAPecansSTD_+75	21.2	2600	278	0.01	0.08
Turf	PATurfSTD_+60	16.5	2600	278	0.01	0.06

Chronic FW RQs		EECs (ug/L)	Endpoints		Chronic Porewater Freshwater Invert	Chronic Porewater Saltwater Inver
Crop Group/Crops	Scenario Giving the Highest EECs	Porewater	FW Sed Invert	SW Sed Invert	Chronic RQ	
Artichoke	Artichoke	19.9	3800	7500	0.01	0.00
Beans & Peas	ILbeansNMC_+65	44.4	3800	7500	0.01	0.01
Brassica Leafy Vegetables	CAColeCropRLF_V2_+65	34.6	3800	7500	0.01	0.00
Bulb Vegetables	GAOnion_WirrigSTD_+210	21.5	3800	7500	0.01	0.00
Canola	NDcanolaSTD_+95	30.3	3800	7500	0.01	0.00
Carrot	FLcarrotSTD_+0	32.6	3800	7500	0.01	0.00
Cereals: Corn and Sorghum	MScornSTD_+135 & KSCornStd_+160	46.4	3800	7500	0.01	0.01
Cereals: Wheat & others	TXwheatOP_+235	44.9	3800	7500	0.01	0.01
Christmas Trees	Christmas Trees	6.4	3800	7500	0.00	0.00
Citrus	FLcitrusSTD_+145	17.4	3800	7500	0.00	0.00
Cotton	STXcottonNMC_+160 & NCcottonSTD_+75	29.8	3800	7500	0.01	0.00
Cucurbits	STXmelonNMC_+9 & FLCucumberSTD_+0	32.5	3800	7500	0.01	0.00
Fruiting Vegetables	STXvegetableNMC_+170 & FLpeppersSTD_+10	34.8	3800	7500	0.01	0.00
Ginseng	MNsugarbeetSTD_+10	32.2	3800	7500	0.01	0.00
Grapes & Small Vine Fruits	NYGrapesSTD_+90	19.0	3800	7500	0.01	0.00
Grasses for Forage/Seeds	ORgrassesseedSTD_+160	19.4	3800	7500	0.01	0.00
Herbs & Spices	CAColeCropRLF_V2_+60	34.1	3800	7500	0.01	0.00
Hops	ORhopsSTD_+140	22.9	3800	7500	0.01	0.00
Leafy Vegetables + Petiole	CAlettuceSTD_+95	38.1	3800	7500	0.01	0.01

Legume Vegetables W/Soybeans	MSsoybeanSTD_+165	35.4	3800	7500	0.01	0.00
Ornamentals: Residential	CApervious/imperviousRLF		3800	7500	0.00	0.00
Ornamentals: Nurseries	MINurserySTD_V2_+230	28.4	3800	7500	0.01	0.00
Peanut	NCpeanutSTD_+140	29.8	3800	7500	0.01	0.00
Pome Fruits	NCappleSTD_+35	15.4	3800	7500	0.00	0.00
Potato, Tuberous/Corm Vegies	MEpotatoSTD_+120	49.0	3800	7500	0.01	0.01
Small Berries	CAWineGrapesRLF_V2_+150	12.5	3800	7500	0.00	0.00
Stone Fruits	MICherriesSTD_+80	19.5	3800	7500	0.01	0.00
Strawberry	CAStrawberrynonplasticRLF_V2_+5	36.3	3800	7500	0.01	0.00
Sugar beet	MNsugarbeetSTD_+10	32.2	3800	7500	0.01	0.00
Sunflower	CACornOP_+140	16.9	3800	7500	0.00	0.00
Tree nuts	GAPecansSTD_+75	21.1	3800	7500	0.01	0.00
Turf	PAturfSTD_+60	15.6	3800	7500	0.00	0.00

Chronic FW RQs			Endpoints		Chronic Sediment Freshwater Invert	Chronic Sediment Saltwater Inver
Crop Group/Crops	Scenario Giving the Highest EECs	Sediment	FW Sed Invert	SW Sed Invert	Chronic RQs	
Artichoke	Artichoke	356	26000	100000	0.01	0.00
Beans & Peas	ILbeansNMC_+65	795	26000	100000	0.03	0.01
Brassica Leafy Vegetables	CAColeCropRLF_V2_+65	619	26000	100000	0.02	0.01
Bulb Vegetables	GAOnion_WirrigSTD_+210	385	26000	100000	0.01	0.00
Canola	NDcanolaSTD_+95	542	26000	100000	0.02	0.01
Carrot	FLcarrotSTD_+0	584	26000	100000	0.02	0.01
Cereals: Corn and Sorghum	MScornSTD_+135 & KSCornStd_+160	831	26000	100000	0.03	0.01
Cereals: Wheat & others	TXwheatOP_+235	804	26000	100000	0.03	0.01

Christmas Trees	Christmas Trees	115	26000	100000	0.00	0.00
Citrus	FLcitrusSTD_+145	311	26000	100000	0.01	0.00
Cotton	<i>STXcottonNMC_+160</i> & NCcottonSTD_+75	533	26000	100000	0.02	0.01
Cucurbits	<i>STXmelonNMC_+9</i> & FLcucumberSTD_+0	582	26000	100000	0.02	0.01
Fruiting Vegetables	<i>STXvegetableNMC_+170</i> & FLpeppersSTD_+10	623	26000	100000	0.02	0.01
Ginseng	MNsugarbeetSTD_+10	576	26000	100000	0.02	0.01
Grapes & Small Vine Fruits	NYGrapesSTD_+90	340	26000	100000	0.01	0.00
Grasses for Forage/Seeds	ORgrassesseedSTD_+160	347	26000	100000	0.01	0.00
Herbs & Spices	CAColeCropRLF_V2_+60	610	26000	100000	0.02	0.01
Hops	ORhopsSTD_+140	410	26000	100000	0.02	0.00
Leafy Vegetables + Petiole	CAlettuceSTD_+95	682	26000	100000	0.03	0.01
Legume Vegetables W/Soybeans	MSsoybeanSTD_+165	634	26000	100000	0.02	0.01
Ornamentals: Residential	CApervious/imperviousRLF		26000	100000	0.00	0.00
Ornamentals: Nurseries	MINurserySTD_V2_+230	508	26000	100000	0.02	0.01
Peanut	NCpeanutSTD_+140	533	26000	100000	0.02	0.01
Pome Fruits	NCappleSTD_+35	276	26000	100000	0.01	0.00
Potato, Tuberous/Corm Vegies	MEpotatoSTD_+120	877	26000	100000	0.03	0.01
Small Berries	CAWineGrapesRLF_V2_+150	224	26000	100000	0.01	0.00
Stone Fruits	MICherriesSTD_+80	349	26000	100000	0.01	0.00
Strawberry	CAStrawberrynonplasticRLF_V2_+5	650	26000	100000	0.02	0.01
Sugar beet	MNsugarbeetSTD_+10	576	26000	100000	0.02	0.01
Sunflower	CACornOP_+140	303	26000	100000	0.01	0.00
Tree nuts	GAPecansSTD_+75	378	26000	100000	0.01	0.00

Turf	PAturfSTD_+60	279	26000	100000	0.01	0.00
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Appendix 3: Calculation of the Seed Treatment Applciation rates and an Example T-Rex Run for Peanut Seed-Treatment

Chemical Name:	Fluopyram ST	Application Rate (lb ai/acre)
Seed Treatment? (Check if yes)	<input checked="" type="checkbox"/>	TRUE
Use:	5	Seeding Rate (lbs/acre)
Product name and form:	Fluopyram ST	18.9
% A.I. (leading zero must be entered for formulations <1% a.i.):	100.00%	
Application rate (fl oz/cwt)	3.83	
Half-life (days):	35	
Application Interval (days):	0	
Number of Applications:	1	
Are you assessing applications with variable rates or intervals?	no	

Endpoints	Reported	Tested Body Weight (g)	Adjusted LD50
Avian LD50:	2000.00	178	1440.86
Avian repro.			
NOAEC:	46.70		1834.29
			2591.00
Mammalian LD50:	2000.00	350	4395.66
Mammalian NOAEL:	260.00		3556.56
			1538.32
		Adjusted NOAEL for Mammals	
		Small (15g)	28.57
		Medium (35g)	23.12

	Large (1000g)	10.00
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Maximum Application Rate (lbs ai/A)	Maximum Seed Application Rate (mg ai/kg seed)	Avian Nagy Dose (mg ai/kg-bw/day)	Mammalian Nagy Dose (mg ai/kg-bw/day)	Available AI (mg ai ft-2)
0.03	1496.09	378.64	316.98	0.29
		215.92	219.08	
		96.67	50.79	

Risk Quotients†				
Avian (20 g)			Mammalian (15 g)	
Acute (# 1)	Acute (# 2)	Chronic	Acute (# 1)	Acute (# 2)
0.26	0.01	32.04	0.07	0.00
Avian (100 g)			Mammalian (35 g)	
Acute (# 1)	Acute (# 2)	Chronic	Acute (# 1)	Acute (# 2)
0.12	0.00	32.04	0.06	0.00
Avian (1000 g)			Mammalian (1000 g)	
Acute (# 1)	Acute (# 2)	Chronic	Acute (# 1)	Acute (# 2)
0.04	0.00	32.04	0.03	0.00

Appendix 4: Calculation of the EECs and RQs from Spray Treatment
Application rates and an Example T-Rex Run for the maximum
application rate

Chemical Name:	Fluopyram ST
Use	0
Formulation	Privelege
Application Rate	0.25 lbs a.i./acre
Half-life	35 days
Application Interval	5 days
Maximum # Apps./Year	2
Length of Simulation	1 year
Variable application rates?	no

Endpoints			
Avian	Bobwhite quail	LD50 (mg/kg-bw)	2000.00
	Mallard duck)	LC50 (mg/kg-diet)	4604.00
	Bobwhite quail	NOAEL(mg/kg-bw)	0.00
	Bobwhite quail	NOAEC (mg/kg-diet)	46.70
Mammals		LD50 (mg/kg-bw)	2000.00
		LC50 (mg/kg-diet)	0.00
		NOAEL (mg/kg-bw)	13.00
		NOAEC (mg/kg-diet)	260.00

Dietary-based EECs (ppm)	Kenaga Values
Short Grass	114.34
Tall Grass	52.41
Broadleaf plants	64.32
Fruits/pods/seeds	7.15
Arthropods	44.78

Avian Class	Body Weight (g)	Ingestion (Fdry) (g bw/day)	Ingestion (Fwet) (g/day)	% body wgt consumed	FI (kg-diet/day)
Small	20	5	23	114	2.28E-02
Mid	100	13	65	65	6.49E-02
Large	1000	58	291	29	2.91E-01
Granivores	20	5	5	25	5.06E-03
	100	13	14	14	1.44E-02
	1000	58	65	6	6.46E-02

Avian Body Weight (g)	Adjusted LD50 (mg/kg-bw)
20	1440.86
100	1834.29
1000	2591.00

Dose-based EECs (mg/kg-bw)	Avian Classes and Body Weights (grams)		
	small 20	mid 100	large 1000
Short Grass	130.23	74.26	33.25
Tall Grass	59.69	34.04	15.24
Broadleaf plants	73.25	41.77	18.70
Fruits/pods	8.14	4.64	2.08
Arthropods	51.01	29.09	13.02
Seeds	1.81	1.03	0.46

Dose-based RQs (Dose-based EEC/adjusted LD50)	Avian Acute RQs Size Class (grams)		
	20	100	1000
Short Grass	0.09	0.04	0.01
Tall Grass	0.04	0.02	0.01
Broadleaf plants	0.05	0.02	0.01
Fruits/pods	0.01	0.00	0.00
Arthropods	0.04	0.02	0.01
Seeds	0.00	0.00	0.00

Dietary-based RQs (Dietary-based EEC/LC50 or NOAEC)	RQs	
	Acute	Chronic
Short Grass	0.02	2.45
Tall Grass	0.01	1.12
Broadleaf plants	0.01	1.38
Fruits/pods/seeds	0.00	0.15
Arthropods	0.01	0.96

Mammalian Class	Body Weight	Ingestion (Fdry) (g bwt/day)	Ingestion (Fwet) (g/day)	% body wgt consumed	FI (kg-diet/day)
Herbivores/ insectivores	15	3	14	95	1.43E-02
	35	5	23	66	2.31E-02
	1000	31	153	15	1.53E-01
Grainvores	15	3	3	21	3.18E-03
	35	5	5	15	5.13E-03
	1000	31	34	3	3.40E-02

Mammalian Class	Body Weight	Adjusted LD50	Adjusted NOAEL
Herbivores/ insectivores	15	4395.66	28.57
	35	3556.56	23.12
	1000	1538.32	10.00
Granivores	15	4395.66	28.57
	35	3556.56	23.12
	1000	1538.32	10.00

Dose-Based EECs (mg/kg-bw)	Mammalian Classes and Body weight (grams)		
	15	35	1000
Short Grass	109.02	75.35	17.47
Tall Grass	49.97	34.53	8.01
Broadleaf plants	61.32	42.38	9.83
Fruits/pods	6.81	4.71	1.09
Arthropods	42.70	29.51	6.84
Seeds	1.51	1.05	0.24

Dose-based RQs (Dose-based EEC/LD50 or NOAEL)	Small mammal 15 grams		Medium mammal 35 grams		Large mammal
	Acute	Chronic	Acute	Chronic	Acute
Short Grass	0.02	3.82	0.02	3.26	0.01
Tall Grass	0.01	1.75	0.01	1.49	0.01
Broadleaf plants	0.01	2.15	0.01	1.83	0.01
Fruits/pods	0.00	0.24	0.00	0.20	0.00
Arthropods	0.01	1.49	0.01	1.28	0.00
Seeds	0.00	0.05	0.00	0.05	0.00

Dietary-based RQs (Dietary-based EEC/LC50 or NOAEC)	Mammal RQs	
	Acute	Chronic
Short Grass	#DIV/0!	0.44
Tall Grass	#DIV/0!	0.20
Broadleaf plants	#DIV/0!	0.25
Fruits/pods/seeds	#DIV/0!	0.03
Arthropods	#DIV/0!	0.17